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STATE OF MONTANA

BOARD OF PROFESSIONAL ENGINEERS AND LAND SURVEYORS

1978

A SUNSET PERFORMANCE REVIEW

77-SS-10

Office of the Legislative Auditor

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October 13, 1978

The Legislative Audit Committee
of the Montana State Legislature:

Herein transmitted is our sunset performance audit of the Montana Board of Professional Engineers and Land Surveyors. The audit was conducted in response to the 1977 sunset law, which terminates the board on July 1, 1979. The intent of the audit was to determine the need for state regulation of Montana's engineering and land surveying professions.

The audit focused upon the six questions of the sunset law and includes an examination of board operations. It does not encompass a review of the board's financial transactions or overall compliance with state laws.

There are no formal recommendations in the report since the responsibility for such recommendations lies with the Legislative Audit Committee. Nevertheless, we discussed the contents of the report with a large number of individuals and organizations, including the director of the Department of Professional and Occupational Licensing, the members of the Board of Professional Engineers and Land Surveyors, the Governor's Office of Budget and Program Planning, the Building Codes Division of the Department of Administration, and numerous professional societies in Montana.

We wish to express our appreciation to the members of the board and to the director of the department and his staff for the assistance they provided during the audit. We also wish to thank other members of the engineering and land surveying professions for assistance they gave us.

Respectfully submitted,

Morris L. Brusett

Morris L. Brusett, C.P.A.
Legislative Auditor

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APPOINTIVE AND ADMINISTRATIVE OFFICIALS

BOARD OF PROFESSIONAL ENGINEERS AND LAND SURVEYORS

		Term Expires
A.T. Kersich, (Engineer), Chairman	Billings	1980
Maurice Guay, (Engineer), Vice Chairman	Missoula	1981
William Tangen, (Engineer-Land Surveyor), Secretary	Helena	1979
Don Henen, (Land Surveyor)	Great Falls	1979
Robert Hafferman, (Engineer-Land Surveyor)	Libby	1982
Louis Fontana (Engineer-Land Surveyor)	Great Falls	1982
Dennis Blackketter (Engineer)	Bozeman	1983

DEPARTMENT OF PROFESSIONAL AND OCCUPATIONAL LICENSING

Ed Carney, Director

Bernice Luck, Administrative Secretary

OFFICE OF THE LEGISLATIVE AUDITOR

SUNSET PERFORMANCE AUDIT OF THE MONTANA BOARD OF PROFESSIONAL ENGINEERS AND LAND SURVEYORS

SUMMARY

Montana's 1977 Legislature passed Senate Bill 162 as Chapter 562, Laws of Montana, 1977, commonly referred to as the "sunset law," which terminates numerous regulatory boards and agencies and specifically calls for a performance audit of each agency prior to scheduled termination. The sunset law terminates the Board of Professional Engineers and Land Surveyors on July 1, 1979. This performance audit is in response to the legal requirement for review of the board prior to termination.

Chapter I (page 1) introduces the report by explaining the objectives and intent of sunset legislation, the six questions which relate to the need for state regulation and activities of the state directed toward meeting that need, and the scope of our audit.

Chapter II (page 5) provides a background on the evolution of engineering and land surveying and a brief history of licensing within Montana. Included is a description of the current licensing law, an explanation of the board's operations (page 15), and its current goals and objectives (page 22).

Chapter III (page 25) addresses the need for regulating engineering and land surveying in Montana in view of actual or potential harm to the public. Two questions are answered--(1) Would the absence of regulation significantly harm and endanger the public's health, safety, or welfare; and (2) Is there a reasonable relationship between the exercise of the state's police power and the protection of the public's health, safety, and welfare? In answer to the first question, we conclude (page 33) that the absence of regulation of the engineering profession could significantly harm and endanger the public's health, safety, and welfare. We conclude that the absence of regulation of the land surveying profession could cause economic or welfare harm to the public.

We found some evidence of public harm with respect to the engineering profession which appeared to be the result of a number of contributing factors, such as inadequate design, construction control, and inspection. These problems could become more commonplace without some form of regulation of professional engineers by government. The economic harm that could result from incompetent land surveyors could affect not only the current property owners, but future property owners and adjoining property owners as well. In addition, we found that federal, state, and local government, along with the private sector, rely on the licensure process as a means of identifying both professional engineers and land surveyors who are qualified. Finally, the licensure process facilitates reciprocity licensing in other states for Montana's professional engineers.

The second question relates to whether the current activities are sufficient to protect the public from potential harm addressed in the first question. In this regard, we conclude that changes in some aspects of the general licensure process should improve the protection of the public's health, safety, and welfare (page 33). The law does not fully control the practice of engineering since it is possible for engineers to become trained and tested in one engineering discipline and practice in a different discipline. Finally, there may be a need for monitoring the competency of professional engineers and land surveyors.

Chapter IV (page 44) addresses a single question--Are all facets of the regulatory process designed solely for the purpose of, and have as their primary effect, the protection of the public? The chapter considers several facets of the board's operations which could be improved. The following conclusions were reached: 1) applicants should be able to sit for the examinations prior to meeting the experience requirements; 2) the complaint process should be more responsive to the public's needs; 3) the board's Code of Ethics should be updated; 4) licensure requirements for county surveyors need clarification; 5) the method of compiling and distributing the board's roster of licensees could be improved; 6) the board's meetings could allow for more public input; and, 7) limited public membership on the board could provide for more representation of the public's interests.

Chapter V (page 77) addresses two questions--Does the regulation have the effect of directly or indirectly increasing the cost of goods or services; and, Is the increase in cost more harmful to the public than the harm which could result from the absence of regulation? Various regulation costs are identified and measured when feasible. We conclude that regulation results in higher costs, but that they are minimal and that probable cost of total deregulation could be significant in relation to potential harm to the public (page 82).

Chapter VI (page 83) addresses the sixth and final question--Is there another less restrictive method of regulation available which could adequately protect the public? The report discusses the present form of regulation used in Montana and other less restrictive alternatives which are available including no regulation (page 84). Included are three tables designed to aid the Legislative Audit Committee in recommending the regulatory alternative most appropriate for Montana, and alternative regulatory facets under each form of regulation (pages 90-92).

Chapter I

INTRODUCTION

This sunset performance audit addresses the need for state regulation of professional engineers and land surveyors by the Board of Professional Engineers and Land Surveyors--a state board within the Department of Professional and Occupational Licensing. The Board of Professional Engineers and Land Surveyors (hereinafter referred to as the board) is responsible for the regulation of the practice of two distinct but related professions in Montana--Engineering and Land Surveying. An engineer is an individual who by reason of special knowledge and use of the sciences and engineering analysis and design, is technically and legally qualified to practice, or to offer to practice engineering. A land surveyor is a specialist in the legal requirements and techniques of measuring land.

REPORT OBJECTIVES

The 1977 Legislature passed a law terminating numerous regulatory boards and agencies, including the Board of Professional Engineers and Land Surveyors. This law is commonly referred to as the "sunset law." The "sunset law" requires the Legislative Audit Committee to conduct a performance audit of each terminated agency. The performance audit must objectively review the need for each regulatory board/agency and offer recommendations for reestablishment, modification, or termination.

In defining legislative intent, the sunset law (Section 82-4601(1), R.C.M. 1947), states that, by requiring periodic evaluation in the form of a performance audit, the legislature will be in a better position to ensure that agencies and programs exist only to be responsive to state citizens' needs. The sunset law terminates the Board of Professional Engineers and Land Surveyors on July 1, 1979. This performance audit is in response to the statutory requirement for a review prior to board termination.

REPORT ORGANIZATION

The sunset law requires the thorough examination of the following questions during the conduct of the performance audit.

> "(a) Would the absence of regulation significantly harm or endanger the public health, safety, or welfare?
> (b) Is there a reasonable relationship between the exercise of the State's police power and the protection of the public health, safety, or welfare?
> (c) Is there another less restrictive method of regulation available which could adequately protect the public?
> (d) Does the regulation have the effect of directly or indirectly increasing the costs of any goods or services involved and, if so, to what degree?
> (e) Is the increase in cost more harmful to the public than the harm which could result from the absence of regulation?
> (f) Are all facets of the regulatory process designed solely for the purpose of and have as their primary effect the protection of the public?"[1]

---

[1] Senate Bill 162, enrolled as Chapter 562, Laws of Montana, 1977, and codified as Title 82, Chapter 46, R.C.M. 1947.

The report focuses on these questions.

Chapter I is introductory. It summarizes the objectives, organization, and scope of the report.

Chapter II presents a brief history of the regulation of engineering and land surveying in Montana. Included in this background information is a history of the current law, and details on the board's organization, operations, objectives, staffing and funding.

Chapter III addresses two of the questions set forth in the sunset law. The first question is whether the absence of state regulation of professional engineers and land surveyors would harm the public. To answer this we reviewed the extent to which the public and others rely upon the state regulatory process. The second question is whether there is a reasonable relationship between the exercise of the state's police power to regulate professional engineers and land surveyors and the protection of the public's health, safety, or welfare. To answer this question we discuss the diversity of engineering and land surveying, and assurance of competency.

Chapter IV addresses another question posed by the sunset law: Whether all facets of the regulatory process are designed solely for public protection. The chapter discusses examination and experience requirements, the complaint process, county surveyors, the board's roster of licensees, public meetings, and public participation in board operations.

Chapter V addresses two other questions of the sunset law. That is, whether state regulation of professional engineers and land surveyors has the effect of directly or indirectly increasing costs to the public and whether such an increase is more harmful than the harm which could result from the absence of regulation.

Chapter VI addresses the final question of the sunset law: Whether there is a less restrictive alternative method of regulation available. The possible alternative forms of regulation are discussed as they relate to the regulation of professional engineers and land surveyors in Montana.

SCOPE OF THE AUDIT

This performance audit primarily addresses the need for state regulation of professional engineers and land surveyors. It focuses upon the six questions posed in the sunset law. It does not encompass a review of the financial transactions of the board or the board's overall compliance with state laws.

Chapter II

BACKGROUND

HISTORY

The first practice of engineering and surveying was probably on early irrigation projects. The early civilizations of the Tigris-Euphrates valley and the valley of the Nile were almost totally dependent on their irrigation systems. These same valleys had some form of boundary surveying as early as 1400 B.C.

The sixteenth century was the beginning of modern engineering. Professional societies were formed, books on engineering subjects were printed, and engineering schools were established. Engineers began to specialize and to utilize scientific discoveries.

Professional societies attempted to regulate the professions of engineering and land surveying somewhat like modern licensing laws. They set entry requirements for those wishing to obtain membership and helped to secure professional status. They were also interested in maintaining high standards of competence and conduct of their members.

The first state to adopt a registration law governing the practice of engineering and land surveying was Wyoming in 1907. This was a result of many self-declared but incompetent engineers and land surveyors rushing to develop the land and water resources of that state. Other states followed suit in a slow but steady progression as shown in Illustration 2-1, below.

Montana was the last state to pass a licensing law. This occurred in 1947. However, many engineers practicing in Montana at the time the licensing law was passed were licensed in other jurisdictions.

Today, all 50 states and five jurisdictions, the District of Columbia, Puerto Rico, the Canal Zone, Guam, and the Virgin Islands, have laws regulating the practice of engineering and land surveying. The last territorial entity to do so was the Virgin Islands in 1968.

ENACTMENT OF ENGINEERING AND LAND SURVEYING REGISTRATION LAWS

Year	Licensing Jurisdictions
1907-1909	2
1910-1919	7
1920-1929	17
1930-1939	18
1940-1949 (includes Montana)	7
1950-1959	2*
1960-1968	2*
Total	55

*Consists of licensing jurisdictions other than states.

Source: Compiled by the Office of the Legislative Auditor.
Illustration 2-1

Origins of the Montana Law

The Montana Civil Engineers' Registration Act was enacted March 1, 1947 after unsuccessful attempts in 1943 and 1945. The act set the standards of the practices of civil engineering and land surveying. It provided for the licensure of civil engineers and land surveyors and for certification of engineers-in-training. The act created the State Board of Registration for Civil Engineers and Land Surveyors consisting of five civil engineers. It also set the minimum qualifications and other requirements for registration.

The law remained unchanged until 1957 when the other professional engineering disciplines were included with civil engineering and land surveying. The board's name was changed to the State Board of Registration for Professional Engineers and Land Surveyors and the board consisted of five professional engineers.

The next major change occurred in 1969. The size of the board was increased by having two registered land surveyor members added to the five professional engineer members. Newly appointed members were required to have qualifications similar to the member whose term was about to expire. Also, the term for board members was limited to two consecutive terms. Finally, partial reciprocity was made available to land surveyors. Reciprocity for engineers was included in the 1947 law.

In 1972 the board was allocated to the Department of Professional and Occupational Licensing in accordance with Executive Reorganization Order 2-72, effective August 1, 1972. The board is allocated to the department for administrative purposes as prescribed in Section 82A-108, R.C.M. 1947. The name of the board was also changed by the Executive Reorganization Act to the Board of Professional Engineers and Land Surveyors.

The next major change, in 1975, was a mandatory requirement that professional engineers have a college degree after July 1, 1979; previously a combination experience/education requirement existed under which a license could be granted without any formal education. For land surveyors, at least two years of education above high school level was required after July 1, 1977, where previously only an experience requirement existed. Also an examination was required for all applicants.

PROFESSIONAL ORGANIZATIONS

There are several state and national organizations involved with professional engineers and land surveyors. Since professional engineers and land surveyors often practice in surrounding states, as well as their primary state of residence, a national organization was needed. In 1920, some of the states with engineering licensure laws formed the National Council of Engineering Examiners (NCEE). NCEE is now a confederation of all 50 state boards and the five territorial boards.

It is a forum by which the member boards formulate policies, rules, regulations, and elect officers and directors.

NCEE has worked to improve and provide uniformity among the states' engineering laws. A major service provided by NCEE is the preparation of the examinations for licensure. NCEE also provides a special service for professional engineers seeking multiple state licensure by serving as a fact-finding and certifying agency for state licensing boards. NCEE compiles and furnishes verified information to state boards concerning the professional records of engineers who have been licensed by another state.

The Engineers' Council for Professional Development (ECPD) is a private national organization that accredits college engineering curricula and engineering technology programs. ECPD accredited engineering curriculums, recognized by the various state boards, are given more weight toward meeting the educational licensure requirements. ECPD often works with NCEE on problems associated with accreditation of engineering programs.

There are also many state and national professional societies that are interested in the practices of engineering and land surveying. NCEE estimates that there are about 400 engineering organizations. The major national professional societies are participating organizations of NCEE.

On the state level the number of engineering and land surveying organizations is less; at least the number of organizations that are interested in the regulation of engineers and land surveyors and have a significant membership are fewer. The relationship between the board and the major state and national engineering and land surveying organizations is shown on Illustration 2-2.

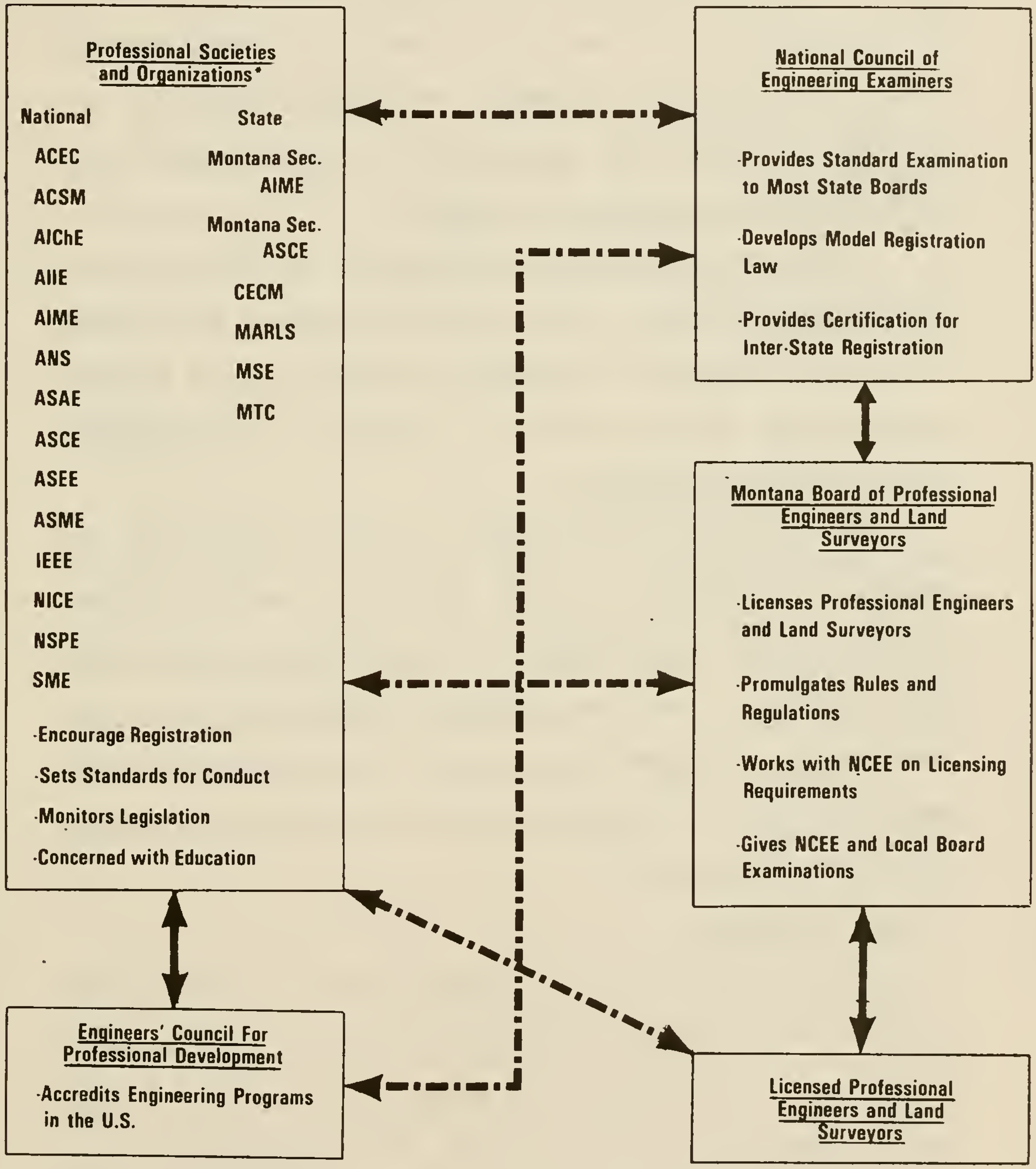
CURRENT LAW

The law that regulates professional engineers and land surveyors is codified as Title 66, Chapter 23, Revised Codes of Montana 1947. This law provides for a seven member board that is discussed later. It also provides definitions for "practice of engineering", "practice of land surveying", "professional engineer", "land surveyor", "engineer-in-training", and "land surveyor-in-training". Exemptions to this act are also noted. Finally, the law sets forth the requirements for licensure for professional engineers and land surveyors and requirements for certification of engineers-in-training and land surveyors-in-training.

Engineering

The "practice of engineering" is defined by law (Section 66-2350(3), R.C.M. 1947). In essence, the practice of engineering consists of any service or creative work, which requires engineering education, training, and experience, and the application of special knowledge of the mathematical, physical, and

BOARD OF PROFESSIONAL ENGINEERS AND LAND SURVEYORS RELATIONSHIP TO STATE AND NATIONAL ORGANIZATIONS


Professional Societies and Organizations*
National
ACEC
ACSM
AIChE
AIIE
AIME
ANS
ASAE
ASCE
ASEE
ASME
IEEE
NICE
NSPE
SME
State
Montana Sec. AIME
Montana Sec. ASCE
CECM
MARLS
MSE
MTC
-Encourage Registration
-Sets Standards for Conduct
-Monitors Legislation
-Concerned with Education
National Council of Engineering Examiners
-Provides Standard Examination to Most State Boards
-Develops Model Registration Law
-Provides Certification for Inter-State Registration
Montana Board of Professional Engineers and Land Surveyors
-Licenses Professional Engineers and Land Surveyors
-Promulgates Rules and Regulations
-Works with NCEE on Licensing Requirements
-Gives NCEE and Local Board Examinations
Engineers' Council For Professional Development
-Accredits Engineering Programs in the U.S.
Licensed Professional Engineers and Land Surveyors

Note: Solid lines indicate direct relationships; dotted lines indicate indirect relationships.

* Only the major organizations are shown. See Appendix I for explanation.

Source: Compiled by the Office of the Legislative Auditor.

Illustration 2-2

engineering sciences. The work includes such services as consultation, investigation, evaluation, planning and design of engineering works and systems, planning the use of water, teaching advanced engineering subjects, engineering surveys, and the inspection of construction for the purpose of assuring compliance with drawings and specifications.

The term "professional engineer" as defined by law (Section 66-2350(1), R.C.M. 1947), means a person who, by reason of special knowledge is qualified to practice engineering, and who has been licensed as a professional engineer by the board.

An "engineer-in-training" is also defined by law (Section 66-2350(2), R.C.M. 1947), as being a person who meets the requirements for education, experience, and character, and has passed an examination in the fundamental engineering subjects, but has not yet passed the principles and practice examination nor been licensed by the board.

Land Surveying

The "practice of land surveying" is also defined by the law (Section 66-2350(6), R.C.M. 1947). The practice of land surveying means any service or work which requires the application and knowledge of the principles of property boundary law, teaching of land surveying subjects, monumenting of property boundaries, and the platting, layout and subdivision of lands.

A "land surveyor" (Section 66-2350(4), R.C.M. 1947), is: a person who has been licensed by the board as a professional specialist in the technique of measuring land.

A "land surveyor-in-training (Section 66-2350(5), R.C.M. 1947), is: a person who has taken, and passed an examination on the basic disciplines of land surveying but is not yet licensed by the board due to the absence of adequate experience and the passing of an examination as required by law.

Exemptions

There are several specific exemptions in the law (Section 66-2367, R.C.M. 1947). For one, the practice of any other legally recognized profession or trade including the practice of architecture when it incidentally includes some engineering is excluded from the engineering licensure requirement. The execution of work by a contractor is also exempted. The work of an employee of a licensed engineer or land surveyor is exempted as long as the employee is under the direct supervision of a licensed engineer or land surveyor. Employees of corporations are also exempt if all of the supervisors are licensed under this act. The final exemption covered by law (Section 66-2350(3), R.C.M. 1947), excludes individuals who operate or maintain machinery or equipment, power lines, telephone lines, or pipelines.

Practice vs. Title

The Montana law is both a "title" and "practice" law. The law (Section 66-2349, R.C.M. 1947), discusses illegal practice and misuse of title as follows:

> ". . . it shall be unlawful for any person to practice or to offer to practice in this state, engineering or land surveying, as defined in this act, or to use in connection with his name or otherwise assume, use or advertise any title or description tending to convey the impression that he is a professional engineer or a land surveyor, unless such person has been duly registered under the provisions of this act."

Consequently, anyone performing professional engineering or land surveying or holding themselves out to the public as a professional engineer or land surveyor in Montana has to be licensed. A recent court case in the Court of Appeals of North Carolina upheld that the use of the title "engineer" cannot be restricted as long as it is not modified by "professional", "licensed", "registered" or some word of like import. The court said that the use of the term "engineer" by unregistered, nonprofessional engineers is not a violation of statutes which prohibit the practice or offering to practice engineering without proper registration.[1]

---

[1] North Carolina State Board of Registration for Professional Engineers and Land Surveyors vs. International Business Machine Corporation (1976) 230 SE 2d 552, 31 N.C. App. 599.

Requirements For Licensure

The board issues certificates of registration for professional engineers and for land surveyors to applicants who meet the requirements of the law. It is also possible for a person to have dual licensure and receive a certificate that authorizes the practice of both professions if he can meet both sets of requirements. In addition, the board issues an enrollment card for engineers-in-training and for land surveyors-in-training if applicants meet the requirements of the law. The requirements for these various licenses are specified by law (Section 66-2357, R.C.M. 1947). There are five ways to qualify for registration as a professional engineer in Montana. One is reciprocity and the remaining four are different combinations of education, experience, and examination. There are three ways to qualify for registration as a land surveyor in Montana. One is partial reciprocity (eight hours of examination are required) and the other two are combinations of education, experience, and examination. (See Chapter IV for a discussion of these qualifications and Appendix II for specific details of the requirements.)

BOARD OPERATIONS

Structure

The board is composed of seven members appointed by the Governor (Section 82A-1602.11, R.C.M. 1947), for staggered terms of five years. Five board members must be professional engineers who: (1) have been engaged in the practice of engineering for at least 12 years; (2) have been in responsible positions of engineering teaching or important engineering work for at least five years, and (3) have been licensed in Montana for at least five years. The other two board members must be land surveyors who: (1) have been engaged in the practice of land surveying for at least 12 years; (2) have been in responsible charge of land surveying or important land surveying work for at least five years; and (3) have been licensed in Montana for at least five years. None of the board members can serve more than two consecutive terms but can be reappointed after a period of two years between appointments.

The law also requires that no more than two of the five engineer members of the board be from the same branch of engineering. Presently, two board members are civil engineers, one is a mechanical engineer, one is an electrical engineer and one is a structural engineer. One other member is also a civil engineer specializing in land surveying. This member is one of the two land surveyor members of the board.

The board is required by law (Section 66-2352, R.C.M. 1947), to hold at least two meetings per year. However, the board generally meets about four times a year in Helena. Board members receive $25 per day compensation plus the travel expenses ordinarily provided by the state.

Staffing and Funding

As a result of the Executive Reorganization Act of 1971, the board is attached to the Department of Professional and Occupational Licensing for administrative purposes. This means that the department provides administrative support to the board in the form of secretarial, legal, budgeting and accounting services, but the board is autonomous in decision-making functions with respect to the licensing process. The time of one full-time departmental employee and one-half the time of another departmental employee are spent on board matters.

The board is financed totally from an account in the earmarked revenue fund. Virtually all of the money for board operations comes from examination, original license and license renewal fees paid by professional engineers and land surveyors. However, an insignificant amount is also received from the sale of documents such as the roster of licensees. The maximum fees chargeable by the board, except for the sale of documents, are set by the law. The actual fees charged are at the maximum level as shown below.

FEE SCHEDULE

	Engineer	Surveyor	Engineer-Land Surveyor*
In-Training Application & Examination	$20	$20	...
Professional Application & Examination			
--With Resident In-Training Certificate	20	20	$40
--With Non-Resident In-Training Certificate	30	30	60
Initial Professional License	12	12	18
Non-Resident Reciprocal License	40	No such license**	
Annual Renewal	12	12	18

* Dual registration.

** No true reciprocity in these cases because applicants must take the 8-hour examination on principles and practices of land surveying.

Source: Compiled by the Office of the Legislative Auditor.

Illustration 2-3

Based on the foregoing, it costs an applicant $20 (in training application and examination fee) to become a licensed engineer or land surveyor in-training, and a total of $52 (in-training application fee plus professional examination fee and initial license) to become a licensed professional engineer or land surveyor. It costs an applicant with a non-resident in-training certificate, $42 to be licensed as a professional engineer or land surveyor, and those already licensed as engineers in another state must pay $40 to be licensed in Montana by reciprocity.

Appropriations for fiscal years 1977-78 and 1978-79 were $51,921 and $55,547 respectively. The following illustration depicts the financial history of the board from fiscal year 1972-73 through fiscal year 1977-78.

BOARD OF PROFESSIONAL ENGINEERS AND LAND SURVEYORS
Financial History

Fiscal Year	Appropriations	Revenue	Expenditures*	Fund Balance
1977-78	$51,921	$45,316	$43,963	$21,234
1976-77	45,895	41,688	39,400	19,881
1975-76	43,392	38,841	44,783	17,593
1974-75	32,039	30,335	32,621	23,535
1973-74	24,396	29,981	27,416	25,821
1972-73	22,057	34,941	21,818	23,256

*Includes prior year expenditures, adjustments and accruals.

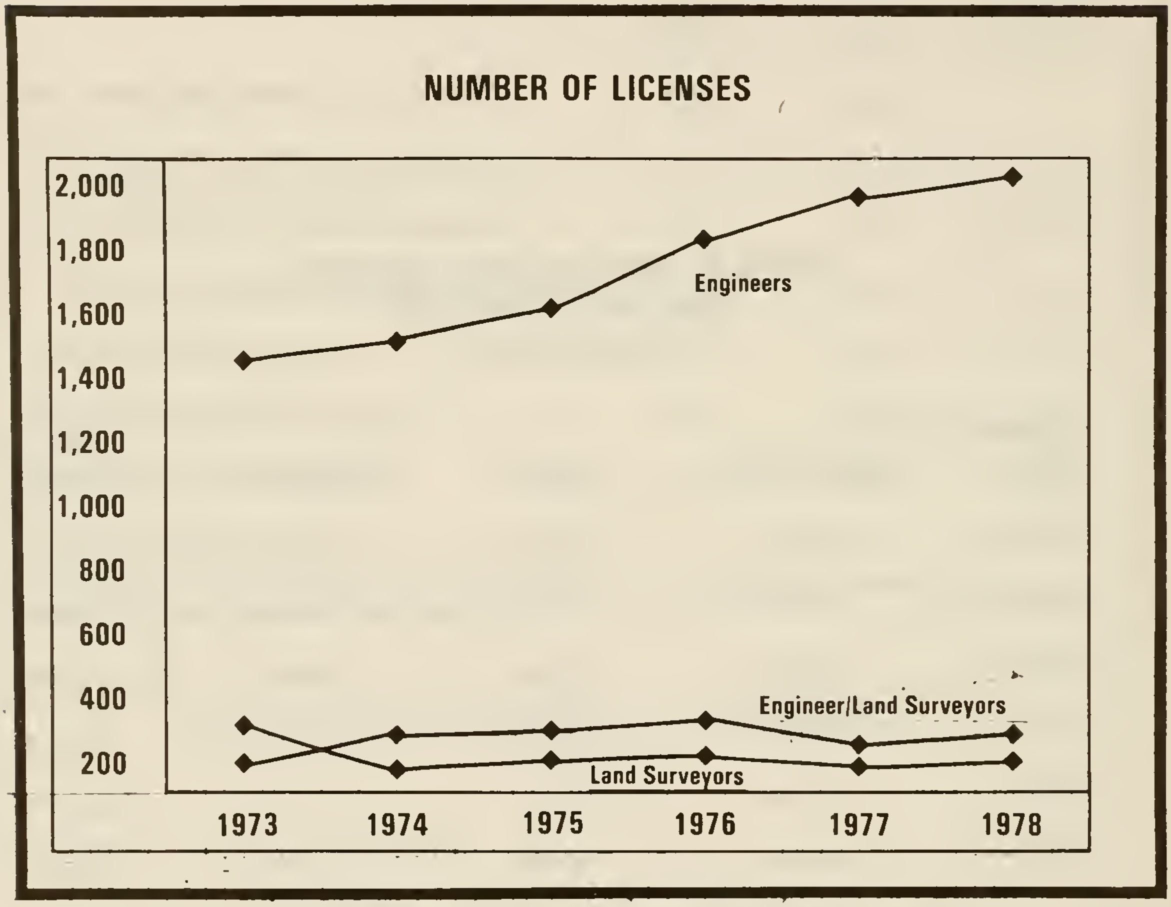
Note: This table shows expenditures exceeding appropriations for three years. This is unlikely and apparently results from the methods used to record certain expenditures.

Source: Compiled by the Office of the Legislative Auditor from Department records without audit.

Illustration 2-4

Licenses

As mentioned earlier in this chapter the board issues three types of licenses. The qualification requirements for these licenses are discussed in Chapter IV. The number of licenses issued over the last six years is shown in Illustration 2-5.



Source: Compiled by the Legislative Auditor from Board records.
Illustration 2-5

A large number of those holding licenses as professional engineers and land surveyors in the state are nonresidents. Various board members and professional trade association officials cite a number of possible reasons for this circumstance including the fact that engineering is a highly mobile profession, the practice of engineering often crosses state lines, and it is a common practice for engineers and land surveyors to maintain a license in their original home state even though they may reside and practice in another state. One of the reasons for this is to facilitate the reciprocity process. The low renewal fee of $12--may also be a reason why nonresidents maintain a Montana license. The number of residents and nonresidents holding Montana licenses is shown in Illustration 2-6.

NUMBER RESIDENTS AND NON-RESIDENTS HOLDING MONTANA LICENSES
AUGUST 1978

	Resident	Non-Resident*	Total
Engineer	694	1,324	2,018
Land Surveyor	141	114	255
Engineer-Land Surveyor	158	134	292

*Includes a small number of licensees residing outside the United States.

Source: Compiled by the Legislative Auditor from Board records.

Illustration 2-6

In addition to the foregoing licenses, the board can also issue temporary permits to nonresidents who are properly licensed as professional engineers in their home state and meet Montana's licensure requirements. These permits authorize nonresident professional engineers to do a specific job in the state within a one year period. The law (Section 66-2368, R.C.M. 1947), prohibits such permits for nonresident land surveyors as not being in the public interest.

BOARD GOALS AND OBJECTIVES

The sunset law requires each board/agency under review to define its goals and objectives. The board has done this. The sunset law also requires boards/agencies to link its expenditures to these objectives. The board has not done this, however, neither have most of the other boards, apparently because they were not aware of the requirement or did not understand it.

The board defined its goal or mission as being:

> "To safeguard life, health, and property, and to promote the public welfare by requiring that only properly qualified persons shall be licensed to practice Engineering and/or Land Surveying in this state."

Based on the preceding goal, the board listed 15 objectives as follows:

1. Provide information and assistance to the public, applicants, registrants, other state agencies and public bodies as needed or required.
2. Review qualifications of 670 applications received, provide annual examinations for 700 applications, certify and/or register those who pass the examinations and to provide reciprocity for 170 out-of-state licenses.
3. Provide annual renewal for 2,800 registrants.
4. Hold at least four Board meetings each year.
5. Provide for rule and disciplinary hearings when required.

6. Defend the licensing law against those who seek licensure and are not fully qualified as determined by the board.

7. Evaluate individually each applicant's experience and qualifications to determine if he meets the minimum requirements of the law.

8. Make available the official seals to registrants for affixing to plans and specifications.

9. Act on 15 complaints involving registrants in accordance with the law and rules.

10. Cooperate with the National Council of Engineering Examiners on a national and zone level by sending Board members to annual meetings.

11. Maintain perpetual records of active and inactive registrants and Board activities.

12. Publish and distribute 3,000 rosters annually.

13. Provide for issuance of engineering temporary permits not to exceed one year.

14. Maintain records on engineers and land surveyors in-training.

15. Cooperate with colleges in encouraging certification of all engineering students, and improving their current and planned curricula for engineers and land surveyors in-training.

Some of the board's activities in terms of some of the objectives are difficult, if not impossible, to measure--for example, providing information and assistance to the public, applicants, etc., as needed or required. An evaluation of the board's accomplishments in this regard would necessitate an assessment of virtually everything the board does. The results of such an assessment may not be meaningful.

Other accomplishments are easier to assess--for example, the objective of providing renewal for over 2,800 licensees. In this regard, the board renewed about 2,500 licenses in 1978.

Overall, it appears that the board accomplishes the objectives outlined for itself. At least our assessment of the board's operations did not disclose any significant instances where the self-imposed goals were not being met.

Chapter III

THE RELATIONSHIP OF STATE REGULATION TO THE PUBLIC'S HEALTH, SAFETY OR WELFARE

This chapter addresses two questions posed by the sunset law. Would the absence of regulation significantly harm or endanger the public's health, safety, or welfare; and, is there a reasonable relationship between the exercise of the state's police power and the protection of the public's health, safety, or welfare? In defining the purpose of the sunset legislation, Montana's sunset law (Section 82-4601, R.C.M. 1947), states that "The legislature questions whether conditions causing the establishment of these agencies, programs, and rules have not changed to such an extent as to remove the need for some or all of the agencies, programs, and rules." This chapter discusses whether a public need continues to exist for the current level of licensure and regulation of professional engineers and land surveyors in Montana.

THE NEED FOR REGULATION

To determine whether the absence of regulation would significantly harm or endanger the public's health, safety, or welfare, one must examine the major reasons underlying the regulation that presently exists.

The intent of the licensing law, (Section 66-2349, R.C.M. 1947), is "to safeguard life, health, and property, and to promote the public welfare." There are three primary reasons for state regulation of engineers and land surveyors: (1) the possibility for public harm from incompetent work; (2) reliance by others on licensing; and (3) the need for a system to facilitate reciprocity licensing in other states and jurisdictions.

PUBLIC HARM FROM INCOMPETENT WORK

Most of those involved with the licensure of engineers and land surveyors were concerned about the possibility of public harm that might occur without state regulation. In other words, the regulatory process assists in avoiding public harm that might otherwise occur.

As a means of obtaining information and data about the views and activities of licensees, we conducted a survey. We mailed a comprehensive questionnaire to a sample of 414 engineers and land surveyors licensed by the state of Montana. Of these, some 218, or 53 percent were completed and returned. The first question asked was, "Do you believe the absence of state regulation of engineers and land surveyors would significantly harm the public health, safety, or welfare?" An overwhelming 89 percent answered yes. They indicated that regulation is necessary to protect the public. Some of the responses indicated how the public harm might manifest itself if licensing was discontinued. Of the professional engineers who responded, 66 percent said that without licensing the physical safety of the public would be threatened by poorly designed structures. A majority of the land surveyors said that without licensing the public would suffer financial and property loss due to misplaced property boundaries. In some cases, these losses would be apparent immediately or within a short period of time when the inaccurate surveying work is discovered. In other instances, the inaccurate work and subsequent public harm may not be found for many years. In either case, it can affect current property owners, as well as future property owners and also adjoining property owners.

Professional engineers who were practicing in Montana prior to 1947 have told us that it was more the potential for harm then actual evidence of harm which convinced the legislature to pass the licensing law. The fact that Montana was the only state without a licensing law for engineers and land surveyors was also thought to have been important in the legislature's decision to pass the licensing law in 1947. We were told of a few incidents of harm prior to the licensing law. One of the incidents is said to have resulted in the death of one person and injury to several others.

Since 1947, there have been several examples of public harm involving licensed engineers and land surveyors. The number of complaints against land surveyors accounts for a significant portion of the time of the board as discussed in Chapter IV. Licensing has not solved all of the problems, but there might be even more serious and more numerous land surveying problems without licensing.

The same can be said with respect to engineering. In recent years there have been several structural failures in engineering projects. Some of these failures are attributed to causes other than engineering and design. The fact that these have occurred is not intended as a criticism of the board, but rather illustrates the fact that without some form of regulation such occurrences may become more commonplace. We were told that one condominium project was so poorly constructed that it cost $1.5 million to repair. The cause of this poor construction was said to be a lack of adequate inspection and code enforcement. Although a licensed professional engineer was involved in the project, he was an electrical engineer and was not qualified to make structural inspections. He was also an employee of the construction contractor. The state Building Codes Division made only a fire code inspection. The result was that the construction did not follow the blueprints and the structure was left in a weakened condition which eventually had to be repaired.

The Building Codes Division told us about three other structural failures besides the condominium discussed above, and we have learned about other structures which have been weakened by seismic disturbances, and some other structural failures due to poor design or poor inspection.

There is also evidence of engineering and architectural design errors and structural failures in areas outside of Montana which illustrate the need for regulation. One such example was the collapse of the roof of the Hartford, Connecticut Coliseum. Preliminary investigation of the collapse indicated that the cause was a design deficiency, as well as inadequate and poorly handled inspection and quality control procedures of the city and the general contractor. The collapse occurred while the roof was under a heavy snow load, and the structure was not adequately designed and constructed to stand such a strain.

Undoubtedly the structural failures described above were the result of a number of contributing factors, such as inadequate design, construction control, and inspection. The fact that they happened could be indicative of the need for some form of regulation of engineers by government. Otherwise, such problems may become more commonplace. In other words, the present regulatory system has served to avoid possibly widespread public harm from incompetent work by engineers and land surveyors.

RELIANCE BY OTHERS ON LICENSING

Based on our review of the engineering and land surveying professions, it is apparent that there is substantial reliance by others upon the licensing process as a means of identifying those who have attained a specified level of competence. Various levels of government, industry, and the public engage engineers and land surveyors to accomplish tasks necessitating such expertise. The licensing process itself is the one process which enables these users to identify those having the appropriate engineering or land surveying expertise. Federal, state, and local agencies, as well as businesses and the public, can use the license as a first means of screening professionals they might want to engage in the design and planning of projects.

Comments on the survey questionnaire we sent to members of the profession disclosed that one reason given for continued licensing was to let the public know who was competent. They view the license as necessary to give the public an assurance that the holder of a license has at least minimal qualifications.

State and local governments in Montana make use of licensed professional engineers and land surveyors for such things as legal surveys and public works as required by law. Also, state and local building code inspectors told us that they rely upon the seal of the licensed professional engineers to ensure that the building codes are followed properly. In some instances, cities require the seal of a licensed professional engineer or architect on all plans and designs submitted for building code approval. For the most part, these levels of government no longer directly do engineering, land surveying, and construction work, but rather rely on licensed engineers and land surveyors as consultants. The licensing process assists them in this regard.

Very recently, some federal agencies have started to require their licensed engineering personnel to place their license seal on design work they have done. This is viewed by some as a move toward holding these individuals professionally responsible for the work they do. The extent to which this practice increases means greater reliance on the license process.

It is apparent that many activities of government--undertaken in the public interest--rely upon the licensing process as a means of identifying those professionals who are qualified. This aspect, combined with the fact that there is the possibility of public harm from incompetent work by engineers and land surveyors, seems to dictate a need for state regulation of engineers and land surveyors.

LICENSING AS A MEANS FOR RECIPROCITY

While the main need for state regulation seems apparent from the possibility of public harm from incompetent work and reliance upon the licensing process, some individuals believe licensing is also needed as a means of facilitating reciprocity. Many of the professional engineers who responded to our survey told us that one reason to continue licensing in Montana was to enable them to receive reciprocal licensing in other states. The requirements for reciprocity, or licensing by endorsement appear to be fairly consistent and uniform in all licensing jurisdictions.

While a need for reciprocity may seem to be important at first glance, it does not appear to be a persuasive justification for state licensure. For those engineers who might wish to practice through reciprocity in other jurisdictions, there may be other methods to attain that right. The NCEE has a "certificate of qualification" which is a national certificate issued by NCEE to professional engineers who meet the requirements. This certificate is used by many states (including Montana) as one basis for reciprocial licensing. However, very few engineers in Montana have this certificate (in fact, only 1,540 out of approximately 475,000 registered engineers in the United States have the certificate) and no such certificate system exists for land surveyors. In addition to the NCEE certificate, licensees seeking the right to practice in other states may be able to acquire an original license in a given state. Some 32 states do not require applicants for a license to be residents. It would be possible for Montana licensees to apply for original licensing in one of those states. Any inconvenience caused by such a process would fall directly upon the licensee who is, of course, the sole beneficiary of another state's license.

Since Montana does not grant full reciprocity, or endorsement for land surveyors, reciprocity with other states is not a consideration for continuing the licensing of land surveyors.

CONCLUSION

Licensing of professional engineers and land surveyors is for the purpose of protecting the public health, safety, and welfare. We have discussed three main areas of the need for regulation of these professions. These areas are public harm from incompetent work, reliance by others on the licensing process, and reciprocity licensing in other states.

Regulation of engineers and land surveyors appears to be necessary to protect the public from the uncontrolled practice of either of these professions.

RELATIONSHIP OF REGULATION TO PUBLIC NEED

In answering the first question dealing with the absence of regulation, we recognized there is a need for regulation of professional engineers in conjunction with design and planning of utilities, structures, equipment, processes and other engineering services. We also recognize the need for regulation of land surveyors not only to protect the users of land surveying services but also to protect their adjoining property owners and future property owners. However, two factors relating to the current exercise of the board powers limit the protection extended to the public. The limiting factors are the cursory regulation of the many engineering disciplines, and the lack of continued competency requirements.

DIVERSITY OF ENGINEERING

Specialization within the engineering profession began in the eighteenth century. Prior to that time, the major field of engineering was military engineering, but most engineers were usually expected to be experts in irrigation system design and architecture, as well as military engineering. The first separate discipline of engineering to appear was civil engineering which encompassed all non-military engineering.

In 1966, NCEE offered its first principles and practice examination which covered the fields of chemical, civil, electrical, and mechanical engineering. To date they have added nine additional disciplines: aeronautical/aerospace, agricultural, ceramic, industrial, manufacturing, nuclear, petroleum, sanitary, and structural. In addition, the NCEE has received requests for examinations in control systems engineering, corrosion engineering, fire protection engineering, mining/minerals engineering, quality engineering, safety engineering, and traffic engineering. The 55 registration boards combined recognize a total of 51 disciplines with Colorado recognizing the most--29 different engineering disciplines. Another indication of the diversity of the engineering profession is the existence of approximately 400 engineering organizations.

Montana and 45 other registration entities license engineers as "professional engineers" only--but not by specific discipline. The nine states that register by discipline in some form are Alaska, Arizona, California, District of Columbia, Hawaii, Kentucky, Louisiana, Nevada, and North Dakota.

Montana's laws do not specifically require or restrict an engineer to practice only in his speciality or discipline. The law (Section 66-2365(1)(b), R.C.M. 1947), states that:

> "(1) the board may revoke, reprimand, suspend, or refuse to renew the certificate of a registrant found guilty of:
>
> . . .
>
> (b) gross negligence, incompetency, or misconduct in the practice of engineering . . .

It could be interpreted that an engineer would be guilty of incompetency if he practiced outside of his discipline. In that case, the board could take specific action against that engineer. However, this has never happened. Some of the board members state that the board expects engineers to practice in the field indicated on their applications. They also stated that the board would take action against engineers who practiced outside of their discipline if it was brought to the board's attention through complaints. Two board members indicated that the board could do very little about controlling the field that an engineer practices in since each engineer is licensed simply as a "professional engineer." The administrative rules adopted by the board do not clarify this issue and it has also been omitted from the board's code of ethics which is included on the license application form which the applicant agrees to follow.

The code of ethics of the National Society of Professional Engineers (adopted 1/74) in Section 6 states: "The engineer will undertake engineering assignments for which he will be responsible only when qualified by training or experience . . . ." Similarily the American Society of Civil Engineers in its Fundamental Canon number two (adopted 9/25/76) states: "Engineers shall perform services only in areas of their competence". Engineers who belong to these and other professional societies are expected to follow the code of ethics that each society adopts.

It appears that the main reasons why engineers do not practice where they are not qualified is a vague and loosely enforced law, possible legal liability, the code of ethics of engineers who belong to professional societies, or for others, a sense of professional obligation.

Some of the comments from our survey of professional engineers mentioned that there should be licensing by engineering disciplines and restriction of practice by discipline. They also mentioned that the public should be informed about an engineer's specialty.

There are few indications of how many engineers practice outside of their discipline or the problems caused by such a practice. Respondents to our survey on this matter must have had some examples to prompt their comments. Also the survey showed some licensed and unlicensed engineers under the supervision of engineers in different disciplines. This could indicate that either the supervisor or the subordinate is practicing outside of his discipline. And finally, there was the previously discussed problem of an electrical engineer working for his employer both as a structural engineer and inspector of a condominium project. Whether or not he was an employee, this engineer was obviously involved in an area outside of his discipline.

ASSURANCE OF COMPETENCY

The law (Section 66-2361, R.C.M. 1947), requires professional engineers and land surveyors to pay a renewal fee each year. This is the only renewal requirement. The only proof of competency are the initial requirements that must be met for entry into the professions. There are virtually no other means of assuring continued competency.

This same situation exists for most other professions; although doctors, lawyers, teachers, and accountants are now required to show some proof of continued competency in some states. Presently, insofar as we could determine, Iowa is the only state with mandatory continued competency requirements for engineers and land surveyors. An official of the board in Iowa advised us that they will begin maintaining continuing education records on licensees on January 1, 1979; however, the actual requirement for continuing education is not effective until 1981. The basic continuing education requirement for those with a full-time practice (1,600 hours or more per year) is 15 hours of formal education and 25 hours of informal education per year. Those who practice part-time (400 hours or less) will be required to have twice as many hours of continuing education--30 hours of formal education and 50 hours of informal education. There is a continuum of continuing education requirements for individuals who fall between 400 hours and 1,600 hours of practice. The formal education requirements are satisfied by structured courses such as college courses and seminars. The informal education requirements are more up to the individual as far as record keeping and which activities qualify. Informal education could consist of self-study, reading of technical journals, and attending professional society meetings.

Proof of continued competency appears to be desirable for several reasons. Probably the reason most often advanced is the theory of technological obsolescence. Basically, this means that passing an examination for licensure in the distant past is not sufficient evidence of current competency. This is particularily true in a fast expanding technology which produces accelerated change and rapid obsolescence.[1]

One example of this was brought up by a board member. He said that he has learned practically everything about pre-stressed concrete construction since graduation from college. Another example relates to electrical engineering. Many electrical engineers were licensed while vacuum tubes were being used in electronic equipment. These were replaced by transitors which were in turn replaced by semi-conductor chips. When someone retains a licensed engineer as an expert, there should be some assurance that he is acquainted with the latest technical advances in his profession, particularily where a public license is involved.

One source of determining possible "technically obsolete" engineers and land surveyors would be those licensed under the grandfather clause. One board member estimated that as many as 20 percent of today's licensees were licensed under grandfather clauses. The only renewal requirement these individuals have had to meet over the years is payment of yearly renewal fees.

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[1] NCEE Pre-Convention Reports to 1978 Annual Meeting, p. 121.

As is the case with most other professional licensing boards, the board relies on the complaint process to identify problem-licensees. Various aspects of the complaint process are discussed later in Chapter IV.

Presently, the board has no means of measuring the competency of licensees other than the absence of complaints. Competency could be either measured or improved by a number of different provisions. Some of these would be by requiring continuing education, peer reviews, or periodic retesting. A continuing education program could be established that would require professional engineers and land surveyors to obtain a minimum number of hours of training each year. A peer review process would allow a select committee of practicing engineers and land surveyors (or a committee of each) under the auspices of the board to periodically review the work of licensees (the plans and specifications of the engineers and the maps, plats, and field notes of land surveyors) as a condition for license renewal. Periodic retesting, similar to the current examination process, could be used to show that the professional engineer and land surveyor maintains a minimum level of knowledge and skills necessary to perform their services.

We asked the board members what type, if any, of continued competency requirement they would prefer. Generally the board opposed any peer review and retesting process as being unfeasible and costly. The board favored the idea of some type of continuing education. One member suggested having the licensees certify that they were actively practicing their profession as a condition of license renewal each year. Such a certification process would be a first step in identifying and possibly eliminating those licensees who are inactive and therefore probably not familiar with present practices. It could be used as a basis for disciplinary action if a false certification was made. Also, professional engineers would have to specify their discipline and therefore would be open to legal action if found to be practicing outside of their field of expertise. In this regard, one board member indicated to us that he would recommend this procedure when the renewal form is next redesigned.

Our survey indicated a strong support, approximately 60 percent of respondents, for some type of license renewal requirement. Over half of those who wanted renewal requirements said that continuing education would be best. Most believed that continuing education should be in the form of seminars and correspondence courses to minimize potential hardships. Other forms expressed in our survey, in descending order of support, were peer reviews, certification of active practice, and retesting.

SUMMARY

Our review indicates there is a need for some form of regulation of professional engineers and land surveyors. The harm that could occur from lack of regulation of professional engineers includes not only economic harm but the possibility of serious injury or even death from improper design and planning of structures, etc. In addition, there is considerable reliance upon the professional engineer by clients and building officials during the design and construction process for ensuring compliance with the state's building codes.

The harm that could occur from an absence of regulation of land surveyors would be economic in nature. In some instances this harm would be immediately noticeable, while in other instances it may remain undisclosed for years. The harm could affect not only the clients of of incompetent land surveyors, but also subsequent and adjacent owners of property.

We conclude that certain aspects of the current exercise of the state's police power and the protection of the public's health, safety, and welfare could be improved. The board does not fully control the practice of engineering since it is possible for engineers to become trained and tested in one engineering discipline and practice in a different discipline.

Finally, there may be a need for monitoring the competency of professional engineers and land surveyors through continuing education, peer reviews, retesting, or certification of active practice.

Chapter IV

THE REGULATORY PROCESS

This chapter addresses one question posed by the sunset law--Are all facets of the regulatory process designed solely for the purpose of, and have as their primary effect, the protection of the public?

REGULATORY PROCESS DESIGN

A national expert on occupational licensing--Benjamin Shimberg--in discussing the origins of licensing, expresses the view that professions initially created voluntary associations to promote their professional interests.[1] Following voluntary organization came the enactment of statutory licensing. Events surrounding the creation of the board generally parallel Shimberg's discussion about origins of licensing. The board was first created in 1947 and was preceded many years by many of the private professional associations described in Chapter II. While these associations were primarily social organizations at the outset, they continually worked for the strengthening of the engineering and land surveyor professions culminating in the enactment of the original licensing law in 1947 and the statutory changes which have occured since that time as traced in Chapter II. In this regard, virtually all of the major changes in the law from the outset to the present time were advanced by the professional associations. Insofar as we could determine, the board has never proposed changes that were strongly opposed by the professional engineering associations. This is not an unusual situation and is common in most, if not all of the evolutionary histories of the licensed professions. That is, the impetus for licensing and the design of the licensing process comes from the professions rather than the public at large.

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[1] Benjamin Shimberg and Barbara A. Esser and Daniel H. Kruger, Occupational Licensing: Practices and Policies, Public Affairs Press, Washington, D.C., copyrighted in 1972 and 1973 by Educational Testing Service and Michigan State University.

LICENSING REQUIREMENTS

There are three categories of qualifications for professional engineer and land surveyor licenses. These three categories are education, experience, and examination. The requirements in these areas are depicted more fully in Appendix II.

Education

The board accepts two kinds of four year college degrees as meeting the educational qualifications for a professional engineer license. One is a degree from a four year engineering curriculum approved by the board. Only those engineering curriculums which are approved by the ECPD have board "blanket" approval. Among these are the degrees at Montana State University and Montana College of Mineral Science and Technology. Other curriculums can be approved on a case-by-case basis.

Applicants for a license in land surveying are required to have a minimum of two years of formal education in an approved curriculum above high school level with at least 90 quarter credit hours. There are three colleges in Montana which offer the land surveying curriculum. They are Northern Montana College, Flathead Valley Community College, and Dawson Community College. The only alternative to this two year educational requirement is to have a four year degree in an approved land surveying curriculum. There are no colleges or universities in Montana which offer a four year degree in land surveying, although Montana State University offers a four year degree in Construction Engineering Technology which meets the land surveying requirement of 90 quarter credit hours in an approved curriculum.

Experience

There are different experience requirements depending upon the applicant's educational qualifications. The experience requirements must be met before applicants can take the principles and practice of engineering examination.

The basic experience requirement for the professional engineer's license is four years approved engineering experience. This experience is obtained after the applicant passes the fundamentals examination of engineering and is an EIT. Those applicants with a four-year engineering degree, approved by the board, must meet a basic four-year experience requirement. Applicants with an engineering or related science degree which is not approved by the board must meet an experience requirement which is doubled--to eight years. Four years of experience are required before taking the fundamentals of engineering examination and four more years are required before taking the principles and practice of engineering examination.

Persons with a college degree which is neither board approved nor accepted by the board as engineering or science related, are not permitted to take the examination. There is a temporary provision which permits persons with eight years acceptable experience to apply for a license, but the provision expires in 1979. Even those who qualify for a license through a section of the law recognizing "long established practice" must have a degree acceptable to the board in addition to twenty (20) years of approved experience.

Applicants for a land surveyor license must have either four or six years of experience depending upon their education. With a four year degree from an approved land surveyor curriculum, an applicant needs two years experience in order to sit for the fundamentals of land surveying examination and two additional years of experience before taking the principles and practice of land surveying examination. With an

Associate of Arts degree from a two year approved land surveying curriculum, an applicant needs four years of experience to take the fundamentals examination and two additional years to take the principles and practice examination. The principles and practice examination is always the final step in the licensing process for both professional engineers and land surveyors.

Examinations

There are sixteen hours of examinations required for each of the two licenses--professional engineer and land surveyor. Both have an eight hour fundamentals examination and an eight hour principles and practice examination. An examination fee of $20 is charged to cover costs of both the engineer and land surveyor examination and related administrative costs. Applicants failing the first examination, are allowed to take the examination one more time without reapplying but have to pay an additional $20.

Engineering Examination

Both the fundamentals of engineering and the principles and practice of engineering examinations are compiled by the NCEE. The fundamentals of engineering examination is entirely a multiple-choice examination which is machine graded and scored. However, the examination requires examinees to work each problem in order to pick the correct answer. The board administers the examination and pays two engineering professors $75 each to proctor the examinations. The examinations are given twice each year, in April and November, and the examination cities alternate between the campuses of Montana State University and Montana College of Mineral Science and Technology, which are the only schools in Montana with approved engineering curriculum.

The principles and practice of engineering examination is also given twice each year, in April and November. However, this examination is proctored by members of the board who are paid the standard--$25 plus per diem and mileage. The examination is given in the Capitol in Helena, unless the legislature is in session at which time is is usually given at Montana State University.

The engineering examinations are composed and graded mainly by engineering professors. However, NCEE is making a real effort to get away from this procedure and is trying to get more examination questions from engineers in industry, government, and private practice. The NCEE, which composes the examinations, emphasizes keeping them up-to-date with developing knowledge in the engineering profession.

The fundamentals examination is intended to test academic knowledge--that acquired during the formal education process. Some members of the engineering profession also contend that the principles and practice of engineering examination also tests academic knowledge. Since it appears that both the fundamentals and the principles and practice examination are academic tests, it may be unreasonable to require applicants to gain several years of experience before they can sit for these examinations. As mentioned earlier, the applicant without an approved engineering degree must wait four years before he can take the fundamentals examination and all applicants must have four years of experience between the fundamentals examination and the principles and practice examination. An applicant should be able to take either of these examinations when he believes he will be able to pass it. This would provide those who desire with an opportunity to take the examinations and, if failing to pass them, consider some alternative career in engineering or some other field.

Land Surveying Examination

The eight hour fundamentals of land surveying examination is also compiled by NCEE. Questions for the examination are submitted to NCEE from licensed land surveyors, including board members and professional associations around the country. In recent years the NCEE committee has critized the land surveying profession for not being active enough in submitting new questions for this examination.

The records of the board indicate the NCEE fundamentals of land surveying examination has been given four times in Montana since 1976, that 30 applicants have taken the examination and that the pass ratio has averaged 70 percent.

The eight hour principles and practice examination for land surveying is prepared by four members of the board in Montana. The law portion of the examination is four hours long and covers the Montana laws governing land. This portion is revised after both the April and November examinations.

The practice portion of the examination is four hours long and the questions are designed to test the practice and certain technical aspects of land surveying in Montana. This examination is revised after each of the two examination sessions in April and November. However, in the case of both sections of this eight hour principles and practice examination in land surveying, some questions will usually be retained and used in later versions of the examination. The passing rate for the principles and practice examination over the last five years was 47 percent.

The examination should be composed with help from many people in the profession rather than just the board members. Members of the board say the have tried to obtain questions from practicing land surveyors such as members of MARLS. They said that occasionally MARLS has sent in questions and that they have been used, but that normally questions from practicing land surveyors have been hard to obtain. On the other hand, members of MARLS say they want the principles and practice examination improved. They say they have sent in many questions for the examination and they have not been used. The questions for both law and practice should be based upon a systemic and documented analysis of actual land surveying work in Montana.

COMPLAINT PROCESS

The board receives 20 to 25 complaints per year; however, files have been established on only 2 to 13 complaints per year or a total of 43 between 1973 and the present. The majority of the complaints are by telephone; however, complaints are also received directly through board members, professional organizations, and other individuals and by letter.

Practically all complaints receive follow-up consideration in the form of a letter from the department; however, very few copies of these follow-up letters are kept in the board files. A complaint register exists which has not been updated since April 1976. This indicates that there is no record of many of the complaints that have been made. The board has indicated that this problem will be eliminated.

Generally a letter is sent to the individual against whom the complaint is charged. A letter is also sent to the individual making the complaint, accompanied by a copy of a formal affidavit form.

There is no systematic file or log entry established on any complaint that does not result in continued correspondence. The affidavit document, requiring legal notarization, must be filed before the board will take any formal action with respect to the complaint. The document also requires that the complaining individual specify the area of alleged misconduct. Most complaints are resolved by agreement of some type between the parties involved.

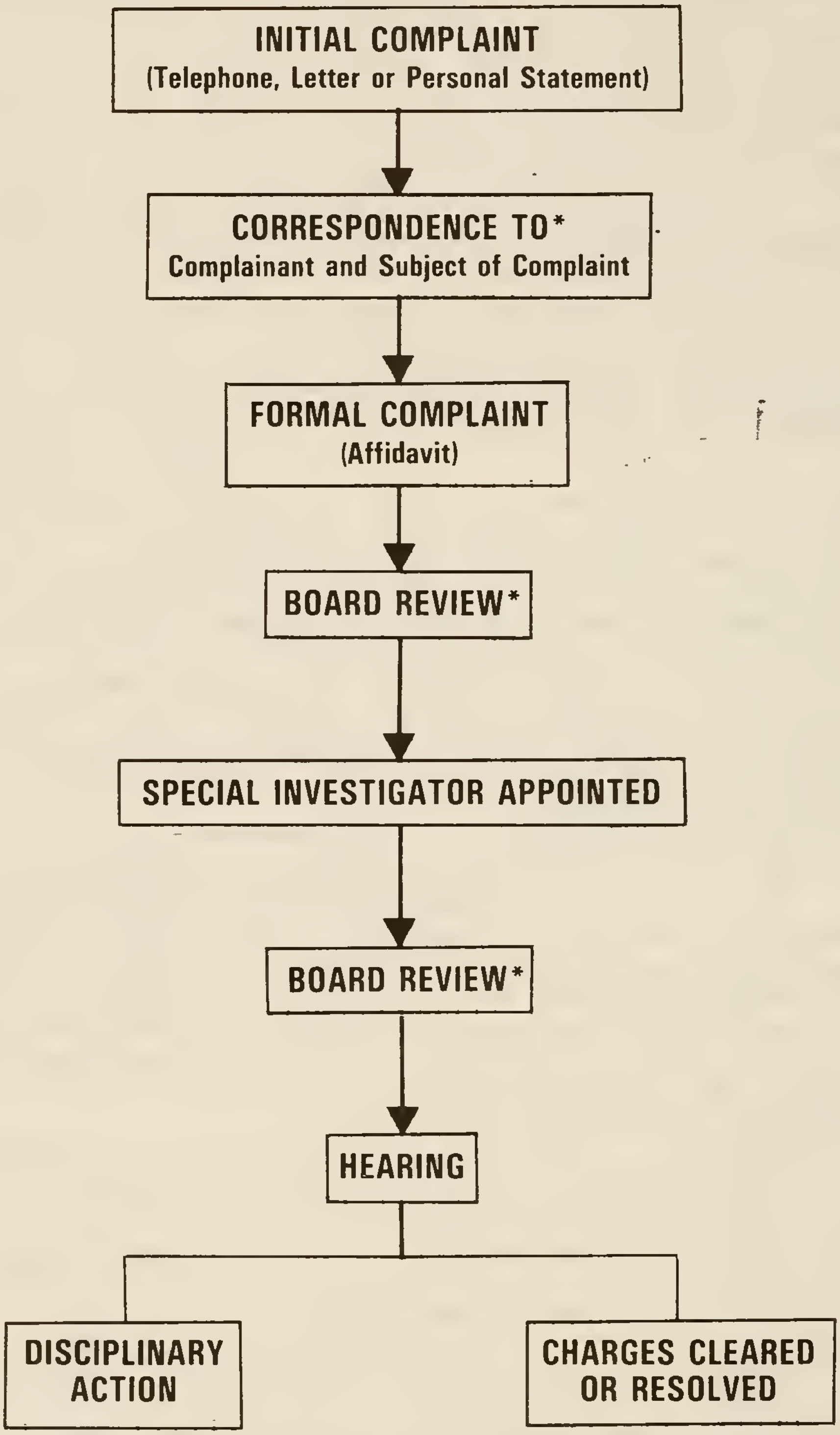
Files are created on only those complaints where problems continue following the initial correspondence. Of the valid complaints that are formally documented, the majority are against land surveyors primarily because they are more likely to be directly involved with the public in circumstances which make any harmful effects more immediately noticeable.

Approximately 50 percent of the documented complaints come from the public. The remaining 50 percent originate from licensees, the board, professional organizations, or government agencies. Of the complaints on file, nearly 50 percent were against unlicensed individuals over whom there is some question regarding the board's jurisdiction.

The board has explicit authority over several areas of professional conduct by licensees including: incompetence, negligence, misconduct, deceit and fraud. Complaints against unlicensed practitioners and other areas for which board authority is uncertain are generally referred to the local county attorney. The board indicated that county attorneys have not taken action on these referrals for apparently a number of reasons, including low priority, local circumstances, etc. Although the board makes such referrals, no such matters have been referred to the board from county attorneys or any other agency during the past six years. This seems unusual; although there have been few serious complaints against engineers, there have been numerous land surveyor problems in several areas of the state, particularily in western Montana. The majority of these involved alleged negligence or error of the land surveyor.

The entire complaint process as depicted in Illustration 4-1 is fairly complex and may take a considerable amount of time even though the board is required by law to act on complaints within three months after receiving the formal affidavit.

Illustration 4-2 indicates the time lags between the filing of the initial complaint and final board action or involvement which may take months or even years depending upon the circumstances. This may be true even if the board initiates proceedings within the three month requirement. The board has indicated that some of the delay in resolving complaints results from it trying to meet all of the necessary legal requirements.


INITIAL COMPLAINT
(Telephone, Letter or Personal Statement)
CORRESPONDENCE TO*
Complainant and Subject of Complaint
FORMAL COMPLAINT
(Affidavit)
BOARD REVIEW*
SPECIAL INVESTIGATOR APPOINTED
BOARD REVIEW*
HEARING
DISCIPLINARY ACTION
CHARGES CLEARED OR RESOLVED

* Complaint may be resolved at this point, prior to hearing.

Source: Developed by the Office of the Legislative Auditor.

Illustration 4-1

COMPLAINTS REGISTERED WITH THE BOARD

	Number of Complaints Resolved and Time Required in Months [1]			
	1-4	5-8	9-12	13 or more
1978[2]	1	2*	...	...
1977	2	...	2	3*
1976	3	3	2	1
1975	1	2	1	1
1974	3	...	...	1
1973	...	...	...	3

[1] Time between receiving initial complaint and conclusion of Board involvement.

[2] Includes complaints received through August of 1978.

* Complaints still in process.

Source: Compiled by the Office of the Legislative Auditor based on data supplied by the Department of Professional and Occupational Licensing.

Illustration 4-2

Based on questionnaire responses and other sources, the time lag before the board will act and the amount of time the board takes to solve complaints are also specific criticisms from the licensees and professional organizations. By not initiating immediate proceedings, certain unethical or incompetent individuals may have an opportunity to cause additional harm to the public. A specific case was noted regarding a licensed land surveyor in western Montana who has had four complaints filed against him by separate clients in the last two years. In three of the four cases the board's action or inaction left the complainants dissatisfied. In the most recent case the licensee from Kalispell relocated a BLM brass corner cap. BLM officials contend that the original cap was correctly positioned as it had been originally established. The BLM has also indicated that they do not feel responsible for the problem. Several residents of the area have been adversely affected by the discrepancy. The board has indicated that they do not feel they have authority in the case even though it does involve a licensed surveyor. The board made an investigation; however, they merely proposed a joint settlement among those involved after indicating the boards inability to act on the matter. The only recourse available to the adversely affected parties is to engage an attorney to resolve the matter at their own expense. This seems to be an unreasonable requirement when the board is the mechanism established by the state to oversee the minimum qualifications and general performance of such a practitioner.

In response to our questionnaire survey and other interviews, some engineer and land surveyor licensees and professional associations also critized the board for not being harsh enough (slap on the wrist approach), against offenders. In other words, they believe more licenses should have been revoked or suspended in the past. The board has indicated that part of the problem is getting people to step forward and make complaints. However, the board has taken disciplinary action to revoke the licenses of two land surveyors and suspend the license of one other land surveyor in the past six years. There were no professional engineer licenses revoked or suspended during the same time. Board disciplinary action in several categories is depicted in Illustration 4-3.

The complexity of the process and the need for legal involvement in the nature of requiring a formal complaint affidavit form may serve to reduce the number of unfounded or frivolous complaints. This is simply because of the time required and the intimidating legal nature of the affidavit; this, however, may not be conducive to the service and protection of the public. That is, it requires the individual making the complaint to specify one or several areas of alleged

DISCIPLINARY ACTION TAKEN BY THE BOARD AGAINST LICENSED ENGINEERS & LAND SURVEYORS

Type of Disciplinary Action	Number of Actions					
	1978[1]	1977	1976	1975	1974	1973
Revocation	---	---	1	---	---	---
Suspension	---	---	1	---	---	---
Cease & Desist	1*	---	2*	1	---	---
Reprimand	---	1	2*	1*	1	---

[1] Through August 1978

*Involved an Engineer

Source: Developed by Office of Legisltive Auditor from data supplied by Department of Professional and Occupational Licensing.

Illustration 4-3

misconduct, thus many valid complaints of a less than clear-cut nature may be neglected. The relevant section of the affidavit reads as follows: "That said person is guilty of fraud, deceit, gross negligence, incompetency, and misconduct (cross out ones not applicable) practiced upon your affiant as follows: (set out in detail the exact facts upon which the charge or charges against the registrant are made) (attach extra pages if required.)" Perhaps more appropriately, a similar form would allow for the individual to merely indicate narratively the circumstances surrounding the complaint and let the board make a determination regarding the category of misconduct.

In the first section of the affidavit, the complaint must also specify whether or not the complaint is against a licensed or unlicensed individual. This information may not be readily available to the public.

A multiple-stage complaint process would have some advantages. It may be more appropriate for the board to actually review each complaint for potential validity prior to requiring the legal formalities of the affidavit. This procedure would reduce the possibility of discouraging valid complaints initially by overcoming the intimidating complexity and legal nature of the affidavit, which in the final section requires notarization.

As indicated previously, the board is uncertain whether it has the statutory authority necessary to handle matters involving unlicensed practitioners. The board's uncertainty in this area has led to instances of inaction by the board when complaints are received regarding unlicensed practitioners.

The board's authority seems rather obvious. First of all, the law governing engineering and land surveying is both a "practice" and "title" law. That is, no one can hold themselves out as a professional engineer or land surveyor nor practice engineering and land surveying unless they are licensed. This would seem to place all unlicensed practitioners within the realm of the board's authority if the board determines that they are either holding themselves out or practicing engineering or land surveying. The board has been advised that they must take complaints against unlicensed practitioners to county attorneys. The board indicated that they have done this but the county attorneys do not follow through on the complaints. Consequently, nothing gets done. The board has written to some unlicensed practitioners particularly when they were discovered through advertising. These letters normally get immediate compliance with the board's requests.

Secondly, the law (Section 66-2366, R.C.M. 1947), specifically states that anyone who violates the engineering and land surveying laws (including the title and practice provisions) is guilty of a misdemeanor and subject to a fine or imprisonment. This penalty provision of law falls within Chapter 23 of Title 66, R.C.M. 1947--the body of law which the board, and only the board, is responsible for administering.

Finally, the board is possibly the only governmental agency which is in a position--knowing the law, rules, and workings of the profession--to take action on behalf of the public. The public generally lacks knowledge in these respects, and should be able to rely on the board--which exists on the public's behalf--to identify and control engineering and land surveying practices which are not in the public interest.

Accordingly, we believe the board has the authority and legal standing necessary to handle matters involving unlicensed practitioners. As mentioned previously, almost all complaints involving engineers involve unlicensed practitioners or firms. The board should assume jurisdiction of these matters. Even if the only action is to file complaints with county attorneys and follow-up to see if action has been taken.

In order to adequately handle the complaint process, accurate and detailed records should be maintained on all complaints whether formal or informal and whether or not additional board involvement results. The board secretary should maintain a complaint log that is kept up-to-date. This complaint log should also show complaints turned over to county attorneys. By doing so, the board may be able to more effectively identify and give special attention to problem individuals allowing faster resolution of actual and potential problems even though no formal affidavits have been filed.

SOLICITATION OF SERVICE

All professional engineers and land surveyors who are licensed are required to sign an affidavit as part of the application for a license. Among other things, the affidavit requires the licensee to pledge to follow the Code of Ethics adopted by the board and included on the application forms. The Code of Ethics on the application form includes a requirement which prohibits competitive bidding.

The board indicated that they decided over a year ago to remove the ban on competitive bidding from the Code of Ethics included on the application forms. A review of the board's minutes shows that on September 29, 1977 the board voted to amend the Code of Ethics on the application forms because of a new NCEE attitude. This new NCEE attitude was discussed in a report dated September 28, 1977 on the 1977 NCEE Annual Meeting and in the 1977 NCEE Proceedings. At the annual meeting it was brought out that the Anti-Trust Division of the Department of Justice had initiated an investigation and inquiry into the activities of NCEE with particular regard to Rule 17 (the ban on competitive bidding) of Chapters I, II, and III of the Model Rules of Professional Conduct. At that meeting the Model Rules were rescinded completely.

While the board may have formally changed its position on competitive bidding, the rule itself remains on the primary document by which the rule was disseminated--the code of ethics depicted on the application for a license.

To date the board still issues application forms with a Code of Ethics that includes a ban on competitive bidding. The board should revise the application form to eliminate any prohibition of competitive bidding and should notify all licensees that the rule has been changed to that effect.

COUNTY SURVEYORS

Montana law (Section 16-2406, R.C.M. 1947) provides that each county may elect or appoint a county surveyor for that county. We found that 9 out of 56 counties have county surveyors. Based on our conversations with counties that do not have county surveyors, county land surveying services in those counties are usually contracted with private licensed surveyors or a state agency such as the Department of Highways. The apparent reason, according to our interviews, is that either there are no qualified persons available or the persons who are qualified do not want the position.

The county surveyor is required by state laws governing counties (Title 33, Chapter 16, R.C.M. 1947) to have certain qualifications and to perform certain duties. The county surveyor is required to be a professional engineer, at least 22 years of age, and have been active in the practice of his profession for at least three years with at least one year at a responsible or in-charge level. The duties of the county surveyor include making all surveys, establishing all grades, and preparing plans, specifications, and estimates in connection with county operations.

The compensation for the county surveyor is fixed by law. In most counties (those with fewer than 20,000 registered voters), the county surveyor is responsible primarily for the duties mentioned previously and is paid $12 per day (Section 25-235, R.C.M. 1947). In the other counties, the county surveyor is responsible for the maintenance of all county roads, bridges, and causeways, in addition to the tasks mentioned previously and is paid a salary based upon the same criteria as other county officials (Section 16-3302(4), R.C.M. 1947).

The licensing act for professional engineers and land surveyors (Section 66-2369, R.C.M. 1947) states that no person who is an official or employee of the state or its political subdivisions shall engage in the practice of engineering or land surveying as defined under the licensing act unless the project is under the direct charge and supervision of a licensed engineer or land surveyor.

From the qualifications and duties enumerated earlier and the definitions of the practice of engineering and land surveying under the licensing act (Section 66-2350, R.C.M. 1947), it would appear that the county surveyor must be a licensed land surveyor. If county surveyors also carry out assignments that are included under the definition of "practice of engineering" (Section 66-2350(3), R.C.M. 1947) then they should also be licensed professional engineers.

Comparison of the county surveyors with the list of persons licensed by the board to practice engineering and land surveying disclosed the following:

- --Three county surveyors were licensed professional engineer/surveyors.
- --Four were licensed land surveyors.
- --Two were not licensed as either engineers or land surveyors.

From this, it would appear that some of the county surveyors in the state are not in compliance with the act providing for licensure of engineers and land surveyors or the act relating to county surveyors. This means that some individuals performing work for the counties have to meet fewer requirements than if they were to provide services as a private licensed land surveyor contracting with the county.

The county land surveyor is also required by law to do any survey which is requested by any person (Section 16-3305, R.C.M. 1947). None of the county surveyors that we contacted do surveys for private individuals as part of their services to the county. It would appear that this provision of the law should be repealed as obsolete. In fact, the entire law governing county surveyors should be reviewed to identify and resolve those areas which conflict with current practices among the counties.

Since county surveyors are often directly involved with the work of other surveyors, it might be beneficial from a public protection standpoint to require them to report any persons doing substandard land surveying to the board or the state agency responsible for regulation of land surveyors for further investigation and possible disciplinary action. This would provide someone at the local level to further protect the public by helping to ensure that land surveyors do high quality work.

ROSTERS

Section 66-2335, R.C.M. 1947, requires the board to publish a roster showing the names and places of business of all licensed engineers and land surveyors. The roster, which must be published each April, must also be mailed to each licensee, filed with the secretary of state, and with the clerks of each city, town and county within the state, and, for a fee, provided to the public upon request.

Based on the preceding requirement, the board mails about 2,800 rosters each year. Most of the rosters are sent free of charge to those specified in the law; however, some rosters are sold for $5 per copy to engineering firms, businesses, etc. The rosters are printed by the state contract printer and are a soft bound booklet with about 100 pages. Besides showing the names, addresses, and license numbers of engineers and land surveyors, both alphabetically and geographically, the booklet also includes the names of past and current board members, board financial statistics, board rules, the licensing law, information about the engineer and land surveyor seal and a sample of the affidavit required for complaints.

A number of city engineering, building, and planning officials indicated to us that they use the roster to determine who is or is not licensed. Similarly, a consulting engineer discussing recent structural failures with us used the 1977 roster as a basis for telling us that an engineer involved in the design of one such structure was not licensed in Montana. Overall, the roster or booklet seems to be an informative and useful mechanism for licensees, as well as users of engineering and land surveying services.

There are several measures which could be taken to make the roster more beneficial to users. First of all, the law requires that the roster be published ". . . during the month of April of each year." The board has had difficulty meeting this deadline simply because of the logistical problems involved, i.e., updating of and organization of over 2,500 licensees, in addition to law changes, rule changes, etc. In 1978, for example, the roster was not available for distribution until October. Since an accurate and timely roster is required by law and apparently would be of benefit to users, the board should explore possible alternatives to the present roster process. Inasmuch as licenses are renewable by January 1st of each year, it is relatively easy for the board to ascertain who has renewed. Rather than republish the entire roster every year, it might be possible for the board to merely publish a biennial roster and in the interim update the roster with a looseleaf flyer--depicting current changes--which could be filed with the last roster.

The board uses a data processing system through the engineering department of MSU to maintain a current file of licensees. Current information on licensees is available from this system quickly and inexpensively. The board already uses this system as a basis for the roster. It might be possible for the board to use this system to prepare a more informal but expeditious listing of licensees.

Finally, the law (Section 66-2356, R.C.M. 1947) requires the board to send the roster to all licensees, as well as others discussed earlier. The board should explore the need for such a distribution and possibly seek a change in the law to allow distribution of the roster to licensees upon request.

PUBLIC MEETINGS

One indication of the extent to which regulation is for public benefit is the amount of public participation in board meetings. Two factors which affect the extent to which the public is able to participate are the location of the meeting and the notice given to the public.

Montana law (Section 82-4226, R.C.M. 1947) requires that "Legislative guidelines should be established to secure to the people of Montana their constitutional right to be afforded reasonable opportunity to participate in the operation of governmental agencies prior to the final decision of the agency." A related section of Montana law (Section 82-4228, R.C.M. 1947) requires each agency to develop procedures for allowing and encouraging public participation. The director of the Department of Professional and Occupational Licensing has developed public participation rules in response to these requirements. The board has adopted these rules.

At the present time, all meetings of the board are held in Helena. The board secretary sends out news releases to each of the state's daily newspapers to announce the board meetings. (The board secretary stated that usually the notice is only published in a newspaper in Billings and Butte.) Board members said that in the past they have held their meetings at various locations around the state and that the general public normally has not attended the meetings. The board told us that, as a general rule, the only members of the public who usually show up at a board meeting are those directly involved in a complaint proceeding. Likewise, individual members of the profession usually do not appear at board meetings unless the board is conducting some type of proceeding which directly and individually affects them.

For example, the board has scheduled a hearing to receive testimony relative to a licensee in Kalispell. The hearing is presently scheduled to be held in Helena in November. Notice of hearing is being sent only to those individuals directly involved in the specific problem at hand, even though a number of other clients of the licensee had previously complained to the board about the licensee. Holding the hearing in Kalispell and notifying these individuals of the hearing would give them an opportunity to present testimony regarding the licensee. This would make the licensing process more responsive to the public.

The reasons for holding all board meetings in Helena, according to members of the board, are that they have better access to the files which are located in Helena and it minimizes travel and expenses for the board because of its central location.

Of those licensees responding to our survey who expressed an opinion, approximately half expressed the view that board meetings in other cities besides Helena would be a benefit to themselves and the public by reducing travel costs for persons wishing to attend meetings and by providing more exposure for the board.

Members of the various professional societies mentioned that rotating meeting sites might be advantageous, but they especially wanted the board to send meeting notices, agendas, and minutes to the officers of the societies. The board said that in the past they have tried this but the society members have not come to the meetings.

Since attendance at a meeting is almost totally precluded if a person is not informed about a meeting, it would be useful for the board to consider whether some additional steps may be taken to assure that meeting notices are published in the state's newspapers. In order to better inform members of the profession as to board activities and to enhance their participation, the board should also consider periodically canvassing the predominate professional associations to see if they routinely want to receive meeting notices, agendas, and meeting minutes.

Rotating meeting sites allows better access to the board by the public and the profession by removing the inhibiting factor of long distance travel. In addition, this would facilitate the opportunity for direct input by the public and the profession. The perceived problem of a lack of access to departmental records should not be difficult to overcome since the board establishes a formal agenda and, as a result, generally knows in advance what major topics are to be resolved.

In this regard, the board indicated that quite often matters not on the agenda come up and access to the files is needed to resolve them. Even if a member of the profession or the public should unexpectedly appear at a meeting outside of Helena and raise an issue for which the board does not have its files, the board could take the matter under advisement until it has had time to review the records in Helena. In such cases, the board would at least have the benefit of direct input from someone who may not have come to Helena.

PUBLIC MEMBERSHIP

In order to facilitate public input into board operations, some jurisdictions have required that regulatory boards have some "public members" as opposed to "professional members." As mentioned previously, Montana requires that all boards members be licensed engineers or land surveyors.

The State Board Secretaries Committee of NCEE surveyed the various state boards to determine how many had public members and what their impact has been. Thirty-nine boards responded to the survey. Eleven of the boards have public members, two more will have them due to recently passed legislation, and twelve anticipate passage of such legislation within five years. The most common comment about public members is that they add balance to board considerations. Others commented that the public members have added little or nothing to the board; however the committee concluded that this may be more a function of personality than anything else.

The National Council of Occupational Licensing Administrators, recently adopted a resolution pertaining to sunset legislation. The resolution provides, in effect, that NCOL supports the concept of public members in significant numbers, on regulatory boards and that such public members should be selected for their ability to contribute to the success of board deliberation and thereby enhance the board's effectiveness in serving the public interest.

Our survey of licensees indicates that approximately one-third believe that there should be some public members on the board. The comments on these surveys generally fall into two categories. Those in favor of public members generally comment that public members tend to bring a balance to the board which keeps the board from becoming too biased or self-serving in its relations with the profession. Those opposed to public membership seem to believe that the public is unqualified to sit in judgment on the profession.

From our interviews with individual board members, the consensus on the board seems to be that public members are not competent to judge professionals. In this regard, one member of the board expressed the view that judgment by peers is more critical in nature than would be judgment by the public.

This belief that public members lack competency seems to have less credence when one looks at other processes, such as the judicial system. Virtually no judges are engineers; yet these people are called to sit in judgment of professionals all the time with only expert testimony to guide them.

SUMMARY

Are all facets of the regulatory process designed solely for the purpose of, and have as their primary effect, the protection of the public? This chapter addresses various facets of the board's operations which could be improved. Specifically, the following items were discussed: 1) applicants should be allowed to sit for the examinations when they feel they are ready, instead of after the experience requirements are met; 2) the complaint process should be more responsive to the public's needs; 3) the board's Code of Ethics on the application form should be updated to remove the ban on competitive bidding; 4) licensure requirements for county surveyors should be decided upon and then set forth in the law; 5) the board's roster of licensees should be made easier to publish on time, made less elaborate, and have its method of distribution reconsidered; 6) the board's meetings could possibly receive more public exposure through improved public notice and occasional changes in meeting location; and, 7) limited public membership could help balance the professions' and public's interests.

Chapter V

COST OF REGULATION

This chapter addresses the fourth and fifth questions posed in the sunset law: Does regulation have the effect of directly or indirectly increasing costs of goods or services? Is the increase in cost more harmful to the public than the harm which could result from the absence of regulation?

COSTS ASSOCIATED WITH REGULATION

Regulation costs take several forms; some may be identifiable and quantifiable while others are hard to identify and involve more of a social or unmeasurable value. Some of these unmeasureable costs can be estimated while others can only be stated by a degree of significance. These social or unmeasurable values include such things as the simple availability of a good or service and the amount of satisfaction derived from goods or services.

It should be kept in mind that the majority of costs caused by government regulation are almost always incurred by the public in the long run, either through government taxes or higher prices of goods or services.

Administrative Costs

Implementation of any regulatory program is bound to cause explicit and quantifiable costs directly related to the specific administrative requirements of the regulation. These costs will generally be dispersed between the regulated industry/profession and the government. The costs incurred by state goverment include such things as the total expenditures of the regulatory agency or board for the performance of the responsibilities of the board. Time expended by other state officials and staff also represent a government cost and the industry or profession may also incur a certain amount of related administrative costs.

Expenditures by the board for the fiscal year 1977-78 were $43,963. The total revenue received by the board during the same period from examination fees, license application, and renewal fees, and reciprocal application fees was $45,316. Revenues and expenditures of board for fiscal years 1972-73 through 1977-78 are indicated in Illustration 2-4. The expenditures are primarily per diem and travel expenses incurred by the board as a result of regular meetings and hearings held to evaluate examination applications and test results, review complaints against registered individuals, examination development for professional land surveyor, etc. As discussed in Chapter II, the board's expenditures are financed through an Earmarked Revenue Fund appropriation. In addition, there are administrative costs incurred for examinations, license renewals, secretarial, and legal work, etc. The Department of Professional and Occupational Licensing estimated department staff time at that of one full-time employee and another half-time employee working on board business.

Generally, the amount of fees collected by the board each year cover the administrative expenditures of the board. Any expenditures by the board in excess of current fee collections are paid for out of the fund balance accumulated from prior years. Overall, the actual cost due to board activities is minimal.

Compliance Costs

Compliance costs represent all costs incurred by government and the profession or industry that result as a direct consequence of enforcing or complying with regulatory requirements. For example, the inspection of a production facility by the U.S. Occupational Safety and Health Administration (OSHA) safety inspector requires governmental expenditures--a governmental compliance cost. The production facility's purchase of safety rails as a result of the inspection requires an expenditure by the private sector--a private sector compliance cost.

As previously mentioned, the board does not routinely check licensees for competence and integrity; however, they develop the Montana Professional Land Surveyor test and monitor the national examinations as well as reviewing complaints made against engineers and land surveyors. Most of these costs are primarily a part of the board's administrative expenditures as they are included as a part of the regular meeting proceedings. However, compliance costs occur when the board determines that a special investigation is necessary to evaluate a complaint filed against a licensee. If a formal hearing is required in conjunction with the suspension or revocation of a license, the expenses could range over $2,000. This would be a compliance cost. Compliance costs also occur when legal problems develop, particularily if a court case is involved. The board also covers the cost of publishing and distributing the annual roster of registrants as well as other required documents. Compliance costs incurred by the profession also include to a degree, the costs associated with such requirements as the education and the experience provisions. These costs are unmeasurable as the qualifications of each individual will vary.

More direct costs that the members of the profession incur are such items as the various examinations and applications fees as well as the original professional license fee. These fees are indicated in Illustration 2-3 and range between $12 and $60. Licensees pay an annual renewal fee of $12 for a professional engineer or land surveyor license and $18 for an engineer-land surveyor license. Individuals wishing to obtain a professional engineer's license through reciprocity also pay a $40 fee. Montana does not allow full reciprocity to land surveyors who are required to pass the board administered examination.

In summary, the compliance costs of the profession are minimal as are those of the state.

COSTS OF DEREGULATION

The cost of deregulation will vary depending upon the profession concerned and the extent of deregulation. Various engineering services encompass areas where there is a potential for harm to the public health, safety, or welfare while land surveying only involves a potential for a welfare or economic harm.

Although the price of services may not change if either profession is totally deregulated, there is a possibility that public harm could result as unqualified individuals attempt to perform engineering or land surveying services. Not only will the public's health, safety, and welfare be adversely affected, but it may also lead to an inefficient use of resources. Eventually, market forces would eliminate the inefficient factors and incompetent professionals; however, serious adverse consequences could result prior to their elimination and at a potentially significant cost to the public.

Current complaints against negligent and unethical land surveyors, in particular, is indicative of the potential for an increase in such problems without some form of regulation. Even more significant problems or catastrophes could develop in the engineering fields as engineering involves health and safety issues. The existence of the board and the present licensing process may act as a dissuasion to unethical or unqualified individuals.

Although not utilized extensively in the past, it should be noted that the public has several alternative aids to protect their interests; including, the Consumer Affairs Division, the Citizen's Advocate and local county attorneys. As previously mentioned, however, the county attorneys have not pursued complaints of this nature; consequently, that alternative may not be beneficial to the public.

Overall, it appears that the probable cost of engineer and land surveyor deregulation could be significant to the public and the state as a whole. The costs that might occur would fall primarily upon the public and only indirectly upon the profession.

SUMMARY

This chapter addressed two questions of the sunset law: Does regulation have the effect of directly or indirectly increasing the cost of goods or services, and is this increase in cost more harmful to the public than the harm which could result from the absence of regulation?

There appears to be relatively minimal public cost involved with the regulation and licensure of professional engineers and land surveyors. The potential cost associated with total deregulation may be significant and probably greater than the present costs.

Chapter VI

LESS RESTRICTIVE REGULATION ALTERNATIVES

A sixth and final question posed by the sunset law requires the evaluation of alternative forms of regulation. Specifically it asks: Is there another less restrictive method of regulation available which could adequately protect the public?

ALTERNATIVE REGULATION APPROACHES

In determining the appropriate regulation of the engineering and land surveying professions there are three major decisions which must be made. These decisions relate to: 1) the proper form of regulation, 2) the regulatory entity that is required under a particular form, and 3) the type and extent of regulatory requirements placed upon each of the professions. Inasmuch as the board regulates two distinct professions--engineers and land surveyors--the result of one decision with respect to one profession may not be suitable for the other profession. Consequently, each of the foregoing decisions must address each of the professions separately.

Following is a brief discussion of the three major decisions. The decision process is then summarized in check-list format. A more detailed discussion of alternative regulation approaches has been prepared as a supplement to this and other sunset audit reports.[1]

THE PROPER FORM OF REGULATION

In relation to the first decision, there are a number of alternative forms of regulation ranging from the most extreme form--licensing similar to the present system--to the least extreme--no licensing or regulation whatsoever. Following is a discussion of seven forms of regulation. They are licensing, practice restriction, reserve of title, limited statutory regulation, registration, certification, and no regulation. As previously mentioned, just because one form of regulation--such as licensing--may be found to be warranted for engineering or land surveying, does not mean it is warranted for both professions.

Licensing involves the stipulation of requirements and prerequisites and the granting of the right or permission to carry on a business or profession. Licensing necessitates an administrative body that establishes rules and monitors the profession or occupation on an ongoing basis. Licensing is considered to be the most extreme form of regulation.

Restriction of practice is the next lesser form of regulation. Under a practice law form of regulation, individuals or companies would not be permitted to perform a specific service or act, or hold themselves out as being able to perform such services, unless they have met certain statutory requirements.

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[1] "Alternative Methods of Regulating Professions, Occupations, and Industries"--A Supplement to the Sunset Performance Audits, Office of the Legislative Auditor, 1978.

Reserve of title is less restrictive than restriction of practice. Under reserve of title regulation, anyone who desires could engage in the profession or occupation. Only the titles "licensed" or "certified," etc., would be reserved for those who had met certain requirements such as an examination.

Limited statutory regulation can be considered even a lesser degree of state regulation than the previous forms. The state would regulate the industry only through statutes specifying certain limitations. Limited statutory regulation differs from a practice law in that there are no statutory requirements that are "job or ability related" (i.e., examination requirement). The law would require only "after-the-fact" protective measures (i.e., bonding and insurance).

Registration, the next alternative, would afford the opportunity to persons practicing in the profession to register with the state or with a private professional association. An individual or company applicant would not have to demonstrate competency to prove qualification, but would just register his name or the company's name.

Certification, as we define it, is individual oriented and requires no direct involvement by a state governmental body. The engineering and land surveying professions would be responsible for certification requirements and procedures, and would be self-regulating. Certification would provide for public identification of those individuals designated by the industry as certified, but the professions could not limit the practice of engineering or land surveying to only those certified.

The least extreme form of regulation is no regulation. The public would still have some protection and recourse through the Consumer Affairs Division of the Department of Business Regulation under the Unfair Trade Practice Act (Chapter 275, Laws of Montana, 1973), which protects the consumer from fraud and deception. The cost of consumer protection through these channels transfers the burden of paying for the protection from the Earmarked Revenue Fund to the General Fund. Criminal and civil remedies can also be sought under the Uniform Commercial Code and other laws directed at specific abuses. It is important to again note that the laws on consumer protection are in effect at the present time and would be in effect under all of the alternatives discussed.

The Regulatory Entity

Regulatory entities can take many forms depending upon the degree of state regulation needed. We have identified six regulatory entities: professional state board, professional-public state board, public state board, state department/agency, professional association, and state/local agency (indirect involvement). Again, what is suitable for one profession may not be suitable for the other.

The traditional form of regulation of professions is accomplished by professional boards. These boards are made up entirely of members of the profession. Presently, the board is made up entirely of professional members. However, some of them are professional engineers and some are land surveyors. In this regard, the board could be entirely engineers or land surveyors, or there could be two separate boards as there are in some other states. Boards can also be made up of a combination of professional members and of members from the public. A board could also consist entirely of members from the public.

Regulation could be accomplished through the direct involvement of a state department or agency. If no direct regulation by the state is necessary, then a professional association could regulate its membership. In addition, indirect involvement by a state agency is available if direct state regulation is not necessary.

For example, the Consumer Affairs Division could investigate and resolve consumer complaints against any industry or occupation even if that industry or occupation were not directly regulated by the state.

Types of Regulatory Requirements

If some form of regulation is determined to be appropriate for the engineering or land surveying professions, then certain requirements and conditions for licensure must also be established. These requirements or conditions could be different for each of the two professions.

Educational, experience, and examination requirements, as conditions for licensure, could be established by statute and administered by the regulatory body. Means of financial protection for the public and licensees could be required in the form of bonding, recovery funds, liability insurance, etc.

The regulatory body, through its administrative branch, may collect fees such as those for examinations and licenses, and issue a document to professional engineers or land surveyors (license) following successful compliance with such prerequisites. The regulating body could have the authority to promulgate rules and adopt codes of conduct. It could deny, suspend, or revoke licenses based upon noncompliance, violations, or incompetency. The regulatory body could also have investigative and monitoring functions.

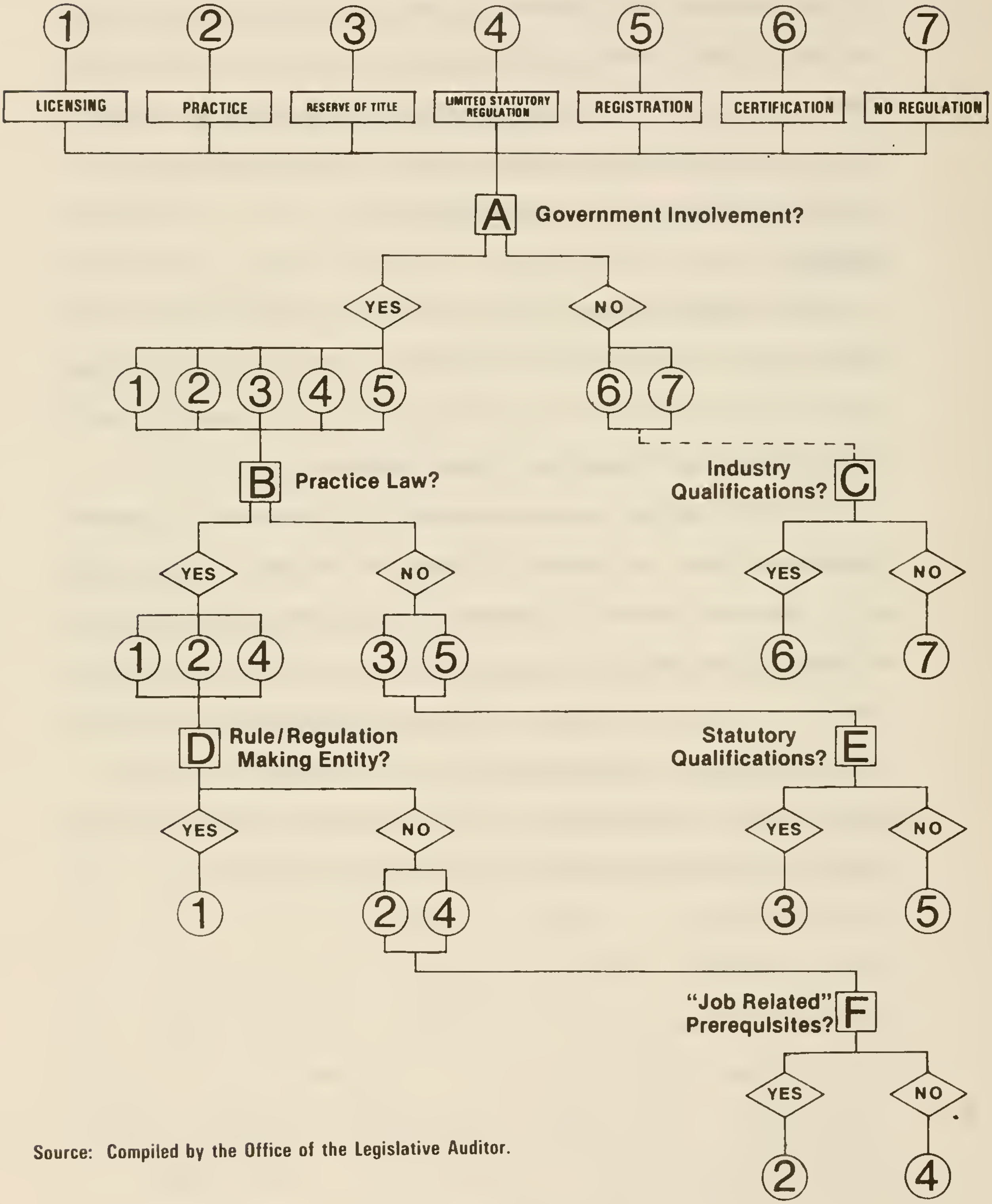
Periodic renewal of licenses could be a requirement. This renewal can be a mere payment of a fee, as is the present situation, or renewal could depend upon the applicant meeting certain qualification standards. Thus, licensees could be required to maintain proficiency through continuing education, passage of a periodic examination, or peer review.

SUMMARY

The decision as to the extent to which the state needs to be involved in regulation of the profession requires the analysis of many factors. We have briefly discussed these factors in this chapter.

These factors are presented in decision chart format in the following Illustrations 6-1, 6-2, and 6-3. A more detailed discussion of the alternative methods of regulation appears in a supplement to this report. The supplement has been designed for all of the regulatory boards subject to sunset reviews. Because the supplement is all inclusive, some of the titles do not match those used in this report.

DECISION CHART TO DETERMINE THE FORM OF REGULATION


①
②
③
④
⑤
⑥
⑦
LICENSING
PRACTICE
RESERVE OF TITLE
LIMITED STATUTORY REGULATION
REGISTRATION
CERTIFICATION
NO REGULATION
A Government Involvement?
YES
NO
① ② ③ ④ ⑤
⑥ ⑦
B Practice Law?
Industry Qualifications? C
YES
NO
① ② ④
③ ⑤
YES
NO
⑥
⑦
D Rule/Regulation Making Entity?
Statutory Qualifications? E
YES
NO
①
② ④
YES
NO
③
⑤
"Job Related" Prerequisites? F
YES
NO
②
④

Source: Compiled by the Office of the Legislative Auditor.

Illustration 6-1

ALTERNATIVE REGULATORY BODY UNDER EACH FORM OF REGULATION

	LICENSING	PRACTICE	RESERVE OF TITLE	LIMITED STATUTORY REGULATION	REGISTRATION	CERTIFICATION	NO REGULATION
PROFESSIONAL STATE BOARD ► Multi-member; or ► Commissioner	■						
PROFESSIONAL-PUBLIC STATE BOARD ► Multi-member	○						
PUBLIC STATE BOARD ► Multi-member; or ► Commissioner	○						
STATE DEPARTMENT/AGENCY ► Direct involvement	○	○	○	○	○		
PROFESSIONAL ASSOCIATION ► Industry involvement					○	○	
STATE/LOCAL AGENCY ► Indirect involvement ► Civil/Criminal Sanctions	○	○	○	○	○	○	○

■ Indicates present form of regulation

Source: Compiled by the Office of the Legislative Auditor.

Illustration 6-2

ALTERNATIVE REQUIREMENTS UNDER EACH FORM OF REGULATION

	LICENSING	PRACTICE	RESERVE OF TITLE	LIMITED STATUTORY REGULATION	REGISTRATION	*CERTIFICATION	NO REGULATION	PRESENT FORM
1. Rule/Regulation Making Entity	●							●
2. Educational Requirements	●	●	●			●		●
3. Experience Requirements	●	●	●			●		●
4. Examination	●	●	●			●		●
5. Right of Denial	●	●	●	●		●		●
6. Revocation/Suspension	●					●		●
7. Issuance of a Document	●				●	●		●
8. Investigation/Enforcement	●					●		●
9. Periodic Renewal	●				●	●		●
10. Continuing Education	●					●		
11. Retesting	●					●		
12. Reciprocity/Comity	●	●	●	●	●	●		●
13. Bonding	●	●	●	●		●		
14. Recovery Fund	●					●		
15. Errors and Omissions Insurance	●	●	●	●		●		
16. Fees	●	●	●		●	●		●
17. Individual Oriented	●	●	●	●	●	●	●	●
18. Facility Oriented	●		●	●	●		●	
19. Peer Review	●	●	●			●		

*Determined by industry body

Source: Compiled by the Office of the Legislative Auditor.

Illustration 6-3

Appendix I

VARIOUS STATE AND NATIONAL ENGINEERING AND LAND SURVEYING ORGANIZATIONS

National

ACEC	American Consulting Engineers Council
ACSM	American Congress on Surveying and Mapping
AIChE	American Institute of Chemical Engineers
AIIE	American Institute of Industrial Engineers
AIME	American Institute of Mining, Metallurgical and Petroleum Engineers
ANS	American Nuclear Society
ASAE	American Society of Agricultural Engineers
ASCE	American Society of Civil Engineers
ASEE	American Society for Engineering Education
ASME	American Society of Mechanical Engineers
IEEE	Institute of Electrical and Electronics Engineers
NICE	National Institute of Ceramic Engineers
NSPE	National Society of Professional Engineers
SME	Society of Manufacturing Engineers

State

AIME	Montana Section, American Institute of Mining Metallurgical and Petroleum Engineers
ASCE	Montana Section, American Society of Civil Engineers
CECM	Consulting Engineers Council of Montana

MARLS	Montana Association of Registered Land Surveyors
MSE	Montana Society of Engineers
MTC	Montana Technical Council

Appendix II

REQUIREMENTS FOR LICENSURE AS PROFESSIONAL ENGINEER AND LAND SURVEYOR AND CERTIFICATION AS ENGINEER AND LAND SURVEYOR-IN-TRAINING

PROFESSIONAL ENGINEER (five ways to qualify)

1) Reciprocity

- --registered by another state, territory U.S. possession or any foreign country, if based on qualifications not lower than Montana's at time of registration.
- --registered in states of residence and original registration (Section 40-3.86(6)-S86070(1) (b), ARM)

2) Engineering graduation

- --four year engineering degree in approved curriculum
- --pass examination on fundamentals of engineering
- --four years of experience approved by board
- --pass 8 hour examination on principles and practices of engineering

3) Engineering-related graduation

- --four year degree in engineering or related science curriculum other than those approved by board
- --eight years of experience approved by board
- --pass examinations on fundamentals of engineering and principles and practices of engineering (16 hours total)

4) Long established practice

- --four year degree in engineering or related science curriculum
- --20 years of experience, 10 of which in charge of important engineering projects
- --pass examination on principles and practices of engineering (8 hours total)

5) Temporary qualifications (expires July 1, 1979)

- --eight years of experience approved by board
- --pass examination prescribed by board

LAND SURVEYOR (three ways to qualify)

1) Out of state (not true reciprocity)

- --registered by or comparable qualifications from another state, territority, or U.S. possession
- --pass examination on principles and practices of land surveying (8 hours total)
- --registered in states of residence and original registration (Section 40-3.86(6)-S8607(1)(b), ARM)

2) Graduation

- --bachelor of science in approved curriculum
- --four years of experience, three of which in charge of land surveying projects under supervision of registered land surveyor
- --pass examinations on fundamentals of land surveying and principles and practices of land surveying (16 hours total)

3) Formal Education

- --two years (90 quarter credits) in approved curriculum above high school level
- --six years of experience, four of which in charge of land surveying projects under supervision of registered land surveyor
- --pass examinations on fundamentals of land surveying and principles and practices of land surveying (16 hours total)

ENGINEER-IN-TRAINING (two ways to qualify)

1) Engineering graduation

- --four year engineering degree in approved curriculum
- --pass examination on fundamentals of engineering (8 hours total)

2) Engineering-related graduation

- --four year degree in engineering or related science curriculum other than those approved by board
- --four years of experience approved by board
- --pass examination on fundamentals of engineering (8 hours total)

LAND SURVEYOR-IN-TRAINING (two ways to qualify)

1) Graduation

- --bachelor of science degree in approved curriculum

- --two years of experience, one of which in charge of land surveying projects under supervision of a land surveyor
- --pass examination on fundamentals of land surveying (8 hours total)

2) Formal education

- --two years (90 quarter credits) in approved curriculum above high school level
- --four years of experience, two of which in charge of land surveying projects under supervision of a land surveyor
- --pass examination on fundamentals of land surveying (8 hours total)